

Chapter Four

IMPACTS OF ALTERNATIVES

I Methodology and Thresholds of Significance

Introduction

In analyzing the environmental consequences of the alternatives proposed in the *Draft Santa Monica Mountains Fire Management Plan/Environmental Impact Statement (EIS)*, three factors are examined for each resource: type of impact, duration of impact, and intensity of impact.

The type of impact describes a relative measure of beneficial or adverse effects on biological or physical systems, cultural resources, or on the social environment. For example, adverse impacts on ecosystems might be those that would degrade the size, integrity, or connectivity of a specific habitat. Conversely, beneficial impacts would enhance ecosystem processes, native species richness, or native habitat quantity or quality.

Impacts from fire management activities may be either short-term or long-term, and it is therefore important to look at the duration of an impact.

Examining the type and duration of an impact is not enough because an impact could cover a large area or a large portion of a population or could be highly noticeable or even irreversible. Impacts are of varying intensities from small and imperceptible to large and substantial. Measures of intensity consider whether an impact would be negligible, minor, moderate, or major. These designations are used to describe both beneficial and adverse impacts.

For each resource topic the impacts associated with each type of fire management action proposed in the alternatives are evaluated. The alternatives, which represent a nested hierarchy of fire management actions, are then evaluated and compared.

In addition, the impact of implementing the alternatives proposed for National Park Service (NPS) lands are analyzed in combination with the impacts of other relevant actions in the area in the cumulative impacts analysis. A cumulative impact is described in the Council on Environmental Quality regulations (40 CFR 1508.7) as: “*the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.*” Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The impact analysis also evaluates whether resources might suffer impairment. Impairment is not

a National Environmental Policy Act (NEPA) issue but instead relates to the *National Park Service Organic Act* (1916). Impairment that is prohibited by the NPS Organic Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Nonetheless, an impact is less likely to constitute impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values.

According to NPS Policy,

“An impact would be more likely to constitute an impairment to the extent that it affects a resource or a value whose conservation is: a) Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; b) Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or c) Identified as a goal in the park’s general management plan or other relevant National Park Service planning documents.” (NPS Management Policies, Part 1.4.5)

II Regulations and Policies

Air Quality

The federal 1963 Clean Air Act (42 U.S.C. 7401 et seq. as amended), stipulates that federal land managers have an affirmative responsibility to protect a park’s air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse air pollution impacts. The Santa Monica Mountains National Recreation Area (SMMN-RA), is designated as a federal Class II airshed. Air quality would be affected in the short-term during any type of ignition event; therefore, it is analyzed as a relevant impact topic.

Water Resources

NPS policies require protection of water resources consistent with the Clean Water Act. Increased erosion following a fire event, planned or unplanned, may affect water quality within and outside of the recreation area; therefore, it is considered a relevant impact topic.

Topography and Soils

NPS policies and Special Directive 91-6 require the consideration of impacts on topography and soils. Soil types within the SMMNRA are highly erosive and subject to post-fire flash flooding, therefore, this is considered a relevant impact topic.

Biotic Communities

The NEPA (1969) requires analysis of impacts on all affected components of the ecosystem, including biotic communities of plants and animals. NPS Management Policies (1988) requires maintenance of these communities, including their natural abundance, diversity and ecological integrity. Fire plays an important role in changes to vegetative cover which in turn affects habitat and overall ecological health; therefore, effects on vegetation and wildland fire are analyzed as an impact topic.

Species of Special Concern (Threatened, Endangered, Candidate, and Rare Species)

The Endangered Species Act (1973) requires disclosure of impacts on all federally threatened or endangered species. Adoption of the *SMMNRA Fire Management Plan* will require consultation with the USF & WS in accordance with Section 7(a)(2) of the Endangered Species Act. NPS policy also requires analysis of effects on federal species, as well as state-listed threatened, endangered, candidate, rare, declining and sensitive species. There are several plant and animal species of concern within the SMMNRA which may be affected by fire management activities; therefore, this is analyzed as a relevant impact topic.

Cultural Resources

The National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.); NEPA; and the *NPS Cultural Resource Management Guidelines* (1994), and Management Policies (1988) require the consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places. The undertakings described in this document are also subject to section 106 of the National Historic Preservation Act, under the terms of the 1995 Programmatic Agreement among the NPS, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. Impacts to cultural resources (archeological, historic, and paleontological) are therefore analyzed in this environmental impact statement. (see ASHFAP appendix).

Native American Graves Protection and Repatriation Act and Consultation Process

NPS and other federal regulations and policies concerning Native American resources and federal trust responsibilities require assessment of impacts to these resources within a framework of government-to-government consultation with affected tribes. This environmental assessment will be reviewed by the the Santa Ynez Band of Mission Indians, as well as by local Chumash and Tongva/Gabrielino groups and individuals who are not federally recognized. It will also be made available to others as requested. Archeological surveys would be completed prior to any prescribed burning or mechanical treatment, as described in mitigation measures common to all alternatives.

Land Use (Proposed Wilderness, External Development, Special Use Permits)

The Wilderness Act (1964), NEPA (1969), and NPS Management Policy requires assessment of effects on wilderness values. There are no designated wilderness areas on federal parklands in the Santa Monica Mountains and the effects of fire management on wilderness values are therefore not included as an impact topic.

NEPA requires identification of potential conflicts with local, state and other federal land use planning, policies, and regulations.

Visitor Use

The mission of the NPS, as described by its Organic Act of 1916, defines the purpose of all parks is to “...conserve the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same ...” Scenic (visual) values, recreational activities, and general visitation within and around fire-treated areas may be temporarily impacted, thus visitor use will be considered as an impact topic.

Socioeconomics

The National Environmental Policy Act (NEPA) considers “impacts to the human environment” to include any effects of federal actions on the social and economic well-being of communities and individuals. The management actions proposed within the park would not generate new jobs and income within the local community; however, some fire personnel may come from outside the area on a temporary basis to assist park staff with a fire event. This impact would be negligible to communities surrounding the park, therefore, it is eliminated from further analysis.

Floodplains and Wetlands

The NPS guidelines and policies require consideration of impacts on floodplains and wetlands (Executive Orders 11988 and 1190).

III Impact Topics Considered and Dismissed

Prime and Unique Farmlands

The California Environmental Quality Act (CEQA) requires an assessment of impacts to all prime and unique farmlands within the project area (August, 1980). These resources do not exist on parklands, therefore, this was not considered a relevant impact topic.

Environmental Justice

Executive Order 12898, “*General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their actions on minorities and low-income populations and communities. The proposals contained in the *SMMNRA Fire Management Plan* would not have adverse impacts on minorities and low-income populations and communities; therefore this topic is not addressed further.

IV Impact Topics

A1a Biological Resources –Vegetation

Thresholds of significance

Impacts are evaluated by analyzing changes in the structure and composition of the vegetation in the dominant plant community types.

Type of Impact

- | | |
|-------------|---|
| Adverse: | Moves the system away from the natural range of variability for vegetation structure and species composition. |
| Beneficial: | Moves the system towards the natural range of variability for vegetation structure and species composition. |

Duration of Impact

Short-term: Transitory, 2-5 years
Long-term: Irreversible, 50-100+ years

Intensity of Impact

Negligible: Imperceptible or undetectable effects upon vegetation.
Minor: Slightly perceptible and localized effects.
Moderate: Measurable change in plant community structure and composition; changes in ecosystem processes (e.g., fire, nutrient cycling, hydrology) on a localized level.
Major: Substantial change in plant community structure and composition; changes in ecosystem processes (e.g., fire regime, nutrient cycling, hydrology) on a landscape scale.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Under the existing program of complete wildfire suppression, fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. The current anthropogenically dominated fire environment has drastically reduced the average fire return interval in the Santa Monica Mountains to 32 years. This is significantly lower than the 100+ interval that would be expected with infrequent natural lightning ignitions. There is no threat to vegetation diversity, composition or structure from excessively long fire return intervals in the Santa Monica Mountains, but type conversion from an unnaturally short fire return interval has been documented. Wildfire suppression is therefore interpreted as generally beneficial to vegetation to the degree that it limits the amount of area burned with increased wildfire frequency.

Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. Suppression is effective in limiting the size of fires under mild and moderate climactic conditions, but is less successful for fires that start in extreme weather conditions. More vegetation may therefore burn under intense conditions than under a more natural fire regime, but in the absence of controlling fire to reduce fire frequency starts (especially arson and power lines), there is little that can be done to limit this impact.

Operational effects associated with wildfire suppression can often be extreme. The act of constructing fire lines, helispots, staging areas, mopping-up and other ground disturbing processes can impact vegetation by killing mature plants, reducing post-fire reproduction through destruction/disturbance of the seed bed, or destruction/disturbance of underground reproductive structures (e.g., burls, bulbs, rhizomes). Suppression operations also create conditions that are favorable to non-natives which may invade fire lines and displace native species. Depending on the vegetation type and the operational methods used, the effects may be short lived if mature plants

resprout and there is vegetative or seed regeneration, or they may be long term if the impacts are sufficient to create type converted or permanently degraded habitat types. Although the use of heavy equipment for fire suppression is prohibited unless authorized by the Santa Monica Mountains superintendent, it is a standard tool for agencies charged with fire management on adjacent lands, and would almost certainly be employed in cases where life or property is at risk.

Mechanical Fuel Reduction

Mechanical fuel reduction in coastal sage, chaparral or woodlands on park properties is generally done with hand tools (chain saw, loppers, weed whips). Dead material and flashy fuels are removed, the density of shrubs is reduced, and trees and large shrubs are limbed up. In grasslands, a tractor pulled disk plows up the annual grasses and forbs in late spring. A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). The vast majority of treated acreage is annual grassland that has been cleared for many years and which retains little or no native vegetation. The vegetation in these areas is degraded and future activities will have no additional impact on vegetation habitat quality. The major concern with these areas is that they are sites where invasive species can become established and potentially move out into adjoining undisturbed habitat areas.

Several park properties were recently treated under the NPS WUI funding program where the local fire department and homeowners have been concerned with park vegetation. The treatment areas included high quality coastal sage scrub, chaparral and oak woodland habitat. Fuel modification in these habitats alters both the normal vegetation structure and community composition and makes the vegetation more susceptible to invasion by non-native annual grasses. Obligate seeding species are lost as the mature plants are removed and there is no fire-stimulated seedling regeneration. To minimize vegetation degradation, only those areas that fall within 200' of residential structures will continue to be maintained as a fuel modification zone. NPS will develop a clear policy statement and procedures to assess existing and potential fuel modification responsibility for properties at the private/public interface with federal parkland. See Appendix A for example.

Ecological Prescribed Fire

Although prescribed fire is unnecessary for ecological health at the landscape level in the shrubland vegetation types in the Santa Monica Mountains, fire may be an effective tool to restore degraded vegetation types. In particular, it can be used to control invasive non-native species or to shift the competitive balance in favor of native over non-native species. Ecological prescribed fire is being used in Cheeseboro Canyon to reduce the non-native seed bank as part of a native grassland and coastal sage scrub restoration project.

A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire. Areas that are potential restoration sites have been identified by overlaying annual grassland and oak savanna vegetation types onto park properties (Figure 2-2, Table 2-3).

Strategic Fuel Reduction

It is not possible to evaluate the vegetation impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental assessment.

Education and Community Support

Education will have positive benefits in preserving the native vegetation of the SMMNRA where it can be used to teach residents appropriate fire safe landscape management techniques. These include appropriate fuel modification techniques that preserve native species; use of appropriate native landscaping; avoidance of non-native plants that increase fuel load; limited use of irrigation; slope preservation; and appropriate structure siting to limit the size of the fuel modification zone.

Any education or community outreach program that effectively reduces fire ignitions will provide a significant benefit by reducing fire frequency. Prevention measures might include closing parklands during extreme weather, no camp fires during fire season, and evaluation of road clearing projects. Efforts to effectively address prevention of fires started by arson and power lines are critical.

Summary by Alternatives

Impacts Common to All Alternatives

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact on vegetation diversity, composition and structure because it reduces the amount of area repeatedly burned in the high fire frequency environment of the Santa Monica Mountains; it is a long-term effect that permanently affects the trajectory of vegetation succession; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression are adverse due to ground disturbance and vegetation destruction; they may be short term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts may be of moderate intensity because effects are measurable and localized, and occur across the landscape with repeated fires.

Fuel modification impacts are also common to all alternatives. Impacts to vegetation diversity, composition and structure from fuel modification are adverse, long-term, and of moderate intensity. However, the majority of the impacts for the project areas covered by this *Draft SMMNRA Fire Management Plan* have occurred from past maintenance activity and are identical among all alternatives including the no-action alternative. No new fuel modification on parkland is anticipated from new development.

Education and community outreach benefits are identical among all alternatives including the no-action alternative.

Mitigation measures are proposed to reduce the adverse impacts to vegetation from the operational impacts of fire suppression activities and fuel modification. Education efforts are recommended that balance fire protection and preservation of vegetation, especially at the wildland urban interface. Any measures that can effectively reduce the fire frequency, by preventing fire starts would be a significant benefit to the vegetation of the Santa Monica Mountains.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact vegetation diversity, composition and structure. Potential impacts to vegetation from landscape mosaic burning are considered to be moderate, adverse, and long-term. No plant communities in the Santa Monica Mountains are in decline from an absence of fire and significant areas of the mountains have experienced a higher than normal fire frequency. Type conversion from a too-short fire return interval is the most significant threat to chaparral communities in the current fire environment. Increasing the amount of area burned in prescribed fires, as proposed under this alternative, increases the amount of area that is at ecological risk from subsequent wildfires with too short a return interval.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to vegetation from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Benefits to vegetation would occur on a landscape level if the technique were successful in limiting the amount of area burned, thereby increasing the fire rotation interval with more effective control of fire spread. Adverse impacts to the areas of treated vegetation would be expected from either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Impacts to vegetation diversity, composition, and structure from ecological prescribed fire are beneficial, long-term, and moderate when this management technique is used as part of the park's program to restore degraded habitat types.

Alternative 4 - Mechanical Fuel Reduction

Impacts to vegetation from mechanical fuel reduction are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the no-action alternative. Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1), includes the benefits of Alternative 3 and the common impacts of Alternative 4. It includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific Environmental Assessment (EA).

Mitigation Measures

Wildfire Suppression – Operational Impacts

- 1) Existing roads, fuel breaks and trails should be used for fire lines; new line construction should be limited to the greatest extent feasible.
- 2) Sensitive habitats that could be impacted by operational activities should be identified by NPS on a GIS database and made available at the Incident Command Post. Fire operations should avoid sensitive habitat areas, especially streams and woodlands, where feasible and in accordance with the guidelines in Appendix C.
- 3) Trees should be preserved during line construction and other operations requiring vegetation clearance.
- 4) NPS GIS weed maps should be made available at the Incident Command Post. Suppression activities that could promote weed spread should be minimized. Fire lines should be restored to natural grade and to conditions that will encourage native plant growth and avoid weed invasions. Monitor for weed invasion from fire activities and provide for removal if necessary. See Appendix E for invasive species of the SMMNRA and the park's proposed weed management plan.

Fuel Modification

- 1) All park fuel modification zones should be monitored for the presence of serious invasive plant species. Species known to be aggressive invaders of wildland areas, particularly perennial herbs and shrubs, should be controlled as part of the mechanical fuel treatment activity. See Appendix E for invasive species of the SMMNRA and the park's proposed weed management plan. Where topography permits, annual grasslands should be mowed rather than disked.
- 2) Adopt State Park's policy as a joint agency policy for fuel modification on park properties where potentially required to provide protection to private property (Appendix A).
- 3) NPS should continue to consult with Los Angeles and Ventura County Fire Prevention and Planning Departments on structure siting so that no vegetation clearance on park property will be required to ensure fire safety to new development adjoining park properties.
- 4) Defensible space zones should assure the greatest level of protection for life and

property possible. The benefits and impacts of 100' vs. 200' clearances should be analyzed. NPS personnel should analyze the potential cumulative habitat impacts of any fuel modification that exceeds the amount necessary to protect structures.

Education and Outreach

- 1) The NPS and other agencies should continue to co-operate and improve outreach methods to inform residents about appropriate fuel modification techniques to preserve native species; the use of appropriate native landscaping; the importance of limiting non-natives that increase fuel load; the importance of limiting irrigation; the importance of preserving slope vegetation; and appropriate structure siting to limit the size of the required fuel modification zone.
- 2) The NPS and other agencies should continue to co-operate in all activities that promote fire prevention in order to reduce fire frequency. Direct park actions include park closures during extreme weather and appropriate limitations on camp fires. The NPS should continue to evaluate the cause of fires and support projects that effectively limit fire starts especially arson and power line ignitions.
- 3) Road clearing projects should be evaluated for effectiveness in meeting clearly defined objectives.

IV Impact Topics

A1b Biological Resources – Wildlife

Threshold Criteria

Fire has been a strong force in the formation of the vegetation that by its structure, distribution, and diversity provides wildlife habitat in the Santa Monica Mountains. Many of the native wildlife species have behaviors or life history characteristics that avoid or are tolerant of fire and the post-fire changes in their habitats. As changes in plant species composition progresses following fires, there are successions of animal species that are favored or disfavored as the plant community changes.

Fire in the Santa Monica Mountains is now more frequent, with a shorter fire return interval, than occurred under natural ignition conditions. The historic pattern of fire has also fluctuated with climate and with the use of fire by native Americans. Finally, the landscape is also more fragmented than in the past. The individual and combined effects of the changes in the fire regime and land use patterns on wildlife are not known. In addition, fire control activities can adversely affect wildlife through direct disturbance of animals and habitats; management actions designed to benefit habitat, such as prescribed fire, can also have adverse effects on wildlife.

Type of Impact

Adverse: Likely to result in unnatural changes in the abundance, diversity, and distribution

of wildlife species. Changes could occur through direct disturbance or mortality, or through destruction or alteration of habitat.

Beneficial: Likely to protect and/or restore the natural abundance, diversity, and distribution of wildlife species. This would occur through protection and restoration of the natural structure, succession, and distribution of habitats.

Duration of Impact

Short-term: Immediate changes in the abundance, diversity, and distribution of wildlife, but a return to the original condition within 20 years, without further affects.

Long-term: Changes in the abundance, diversity, and distribution of wildlife that persist for more than 20 years; the potential for irreversible changes exists.

Intensity of Impact

Negligible: Imperceptible or undetectable impacts.

Minor: Slightly perceptible, and limited in extent. Without further impacts, effects would reverse and the resources would recover.

Moderate: Readily apparent, but limited in extent. Without further impacts, effects would eventually reverse and the affected species would recover to previous levels.

Major: Substantial, highly noticeable, and affecting a large area. Changes would not reverse without active management, if at all.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Under the existing program of complete wildfire suppression, fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. The current anthropogenically dominated fire environment has drastically reduced the average fire return interval in the Santa Monica Mountains to 32 years.

Although many wildlife species avoid direct mortality in wildfires, some individuals of some species are lost. The increased fire frequency with the majority of acreage burned in high intensity fires will cause increased wildlife mortality. However, there is no evidence that there is any long-term impact on wildlife populations. The unnaturally short fire return intervals may cause shifts in wildlife species composition and abundance in degraded, type-converted shrublands. It is unknown whether shifts in native vegetation composition as the result of increased fire frequencies have an effect on wildlife populations. Wildfire suppression is interpreted as generally beneficial to wildlife to the degree that it limits the amount of area burned due to the increased wildfire frequency.

Operational effects associated with wildfire suppression can often be extreme. The act of constructing fire lines, helispots, staging areas, mopping-up, and other ground disturbing processes

can directly impact resident wildlife in nest or burrows. Wildlife may also be indirectly impacted by permanent changes in vegetation that may create conditions that are favorable to non-natives. Although the use of heavy equipment for fire suppression is prohibited unless authorized by the SMMNRA superintendent, it is a standard tool for agencies charged with fire management on adjacent lands, and would almost certainly be employed in cases where life or property is at risk.

Mechanical Fuel Reduction

Fuel modification affects wildlife primarily by displacing animals by destroying or modifying habitat. Fuel modification alters both the normal vegetation structure and the plant community composition and makes vegetation more susceptible to invasion by non-native annual grasses. In shrublands and woodlands dead material and flashy fuels are removed, the density of shrubs is reduced, and trees and large shrubs are limbed up. In grasslands, a tractor pulled disker plows up the annual grasses and forbs in late spring.

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). The vast majority of treated acreage is annual grassland that has been cleared for many years and which retains little or no native vegetation. In these areas, the normal suite of shrubland-adapted wildlife has been displaced by wildlife species that utilize annual grasslands and are tolerant of the ongoing disturbance regime.

Several park properties were recently treated under the NPS WUI funding program where the local fire department and homeowners have been concerned with park vegetation growing within 200' of private homes. These areas have been treated in high quality coastal sage, chaparral and oak woodland habitats. Fuel modification has created a more open habitat with less structural diversity. To minimize wildlife habitat degradation, only those areas that fall within 200' of residential structures will continue to be maintained as a fuel modification zone.

Ecological Prescribed Fire

Ecological prescribed fire is planned only in annual grassland and oak savanna vegetation types. A maximum of 275 acres/project with a maximum of 4 projects/year is proposed. Wildlife impacts from the low intensity fires that occur in these habitat types show minimal short-term animal mortality and no long-term effects on wildlife populations. Mortality observed in a post-fire survey from the 2002, 200-acre prescribed burn in Cheeseboro Canyon included 10 rattlesnakes, and single individuals of alligator lizard, king snake, and ring-neck snake.

Strategic Fuel Reduction

It is not possible to evaluate the wildlife impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

Education will have positive benefits in preserving wildlife habitat in the SMMNRA where it can be used to teach residents appropriate fire safe landscape management techniques. These include appropriate fuel modification techniques that preserve native plant species; use of appropriate native landscaping; avoidance of non-native plants that increase fuel load; limited use of irrigation; slope preservation; and appropriate structure siting to limit the size of the fuel modification zone.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact on wildlife mortality and wildlife habitat quality because it reduces the amount of area repeatedly burned in the high fire frequency environment of the Santa Monica Mountains; it is a long-term effect that permanently affects habitat characteristics; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression are adverse due to mortality and habitat impacts due to ground disturbance and vegetation destruction. Mortality impacts are short-term and minor. Habitat quality impacts may be short-term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts on wildlife habitat may be of moderate intensity because effects are readily apparent, but limited in extent.

Fuel modification impacts are common to all alternatives. Impacts to wildlife habitat from fuel modification are adverse, long-term, and of moderate intensity. However the majority of the impacts for the project areas covered by this *Draft SMMNRA Fire Management Plan* have occurred from past maintenance activity and are identical among all alternatives, including the No-Action Alternative (Alternative 1). No new fuel modification on parkland is anticipated from new development.

Education and community outreach benefits are identical among all alternatives including the No-Action Alternative (Alternative 1).

The mitigation measures that have been proposed to reduce vegetation impacts are also proposed as mitigation measures to reduce wildlife habitat impacts.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact wildlife mortality and wildlife habitat quality. Potential impacts to wildlife from landscape mosaic burn-

ing are considered to be adverse, both short-term and long-term, and of moderate intensity. Increasing the amount of area burned in prescribed fires, as proposed under this alternative, increases wildlife mortality (short-term impact) and increases the amount of wildlife habitat that is at ecological risk of degradation from subsequent wildfires with too short a return interval (long-term-impact).

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to wildlife from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Benefits to wildlife would occur on a landscape level if the technique were successful in limiting the amount of area burned, thereby increasing the fire rotation interval with more effective control of fire spread. Adverse wildlife habitat impacts to the areas of treated vegetation would be expected from either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Impacts to wildlife from ecological prescribed fire include adverse, short-term, minor effects due to mortality in a small number of species and beneficial, long-term, moderate impacts to habitat quality when this management technique is used as part of the park's restoration program of degraded habitat types.

Alternative 4 – Mechanical Fuel Reduction

Impacts to wildlife from mechanical fuel reduction are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the No-Action Alternative (Alternative 1). Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1), includes the benefits of Alternative 3 and the common impacts of Alternative 4. It includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific EA.

Mitigation Measures

Wildfire Suppression - Operational Impacts

- 1) Existing roads, fuel breaks and trails should be used for fire lines; new line construction should be limited to the greatest extent feasible
- 2) Sensitive habitats that could be impacted by operational activities should be identified by NPS on a GIS database and made available at the Incident Command Post. Fire operations should avoid sensitive habitat areas, especially streams and woodlands, where feasible, in accordance with Appendix C guidelines.

- 3) Trees should be preserved during line construction and other operations requiring vegetation clearance.

Fuel Modification

- 1) All park fuel modification zones should be monitored for the presence on serious invasive plant species. Species known to be aggressive invaders of wildland areas, particularly perennial herbs and shrubs, should be controlled as part of the mechanical fuel treatment activity. Where topography permits, annual grasslands should be mowed rather than disked.
- 2) Adopt State Park's policy as a joint agency policy for fuel modification on park properties where potentially required to provide protection to private property (Appendix A).
- 3) NPS should continue to consult with Los Angeles County and Ventura County Fire Prevention and Planning Departments on structure siting so that no vegetation clearance on park property will be required to ensure fire safety to new development adjoining park properties.
- 4) To minimize fuel modification zones, the NPS and other agencies should work together to identify the amount of fuel modification required to protect structures from radiative heat loss or from loss due to direct flame impingement. The NPS should analyze the potential cumulative habitat impacts from fuel modification that exceeds the amount necessary to protect structures (e.g. 100' vs. 200').

Education and Outreach

- 1) The NPS and other agencies should to continue to co-operate and improve outreach methods to inform residents about appropriate fuel modification techniques to preserve native species; the use of appropriate native landscaping; the importance of limiting non-natives that increase fuel load; the importance of limiting irrigation; the importance of preserving slope vegetation; and appropriate structure siting to limit the size of the required fuel modification zone.
- 2) The NPS and other agencies should to continue to co-operate in all activities that promote fire prevention in order to reduce fire frequency. Direct park actions include park closures during extreme weather and appropriate limitations on camp fires. The NPS should continue to evaluate the cause of fires and support projects that effectively limit fire starts especially arson and power line ignitions. Road clearing projects should be evaluated for effectiveness.

IV Impact Topics

A1c Biological Resources – Habitat Connectivity

Threshold Criteria

See A1b Wildlife, page 4-10.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Large fires are an infrequent, but re-occurring event despite the most intensive fire suppression efforts. The current anthropogenically dominated fire environment has drastically reduced the average fire return interval in the Santa Monica Mountains to 32 years.

Wildlife species that would not suffer any long-term impact from wildfire may be adversely impacted by fire in a fragmented landscape. Wildlife persistence and recovery may be substantially altered by the combined effects of fragmented habitats and fire due to: 1) the local disappearance (extinction) of some species in fragmented areas that have burned; 2) the inability of some species to respond to and recover from fires because of the decrease in escape routes and reduced chances of recolonization after fire; and 3) frequent human-caused fires in fragmented areas may facilitate the movement of edge effects into natural systems, impacting native biota. Each of these effects is exacerbated with the occurrence of large, intense fires and by the increased fire frequency. Although there is virtually no quantitative data on the interactive effects of habitat fragmentation and wildfire on wildlife populations, wildfire suppression is interpreted as generally beneficial to impacts associated with habitat fragmentation to the degree that it limits the amount of area burned due to the increased wildfire frequency.

Operational effects may add to habitat fragmentation. The act of constructing fire lines, helispots, staging areas, mopping-up and other ground disturbing processes may further subdivide the landscape. Subtle habitat fragments may be created by permanent type conversion of native vegetation or by changes that create conditions that are favorable to non-natives.

Mechanical Fuel Reduction

Fuel modification is one of the causes of habitat degradation associated with urbanization that displaces wildlife, alters vegetation structure and composition, and facilitates establishment of non-native species.

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface, on the margins of park properties, where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). The vast majority of treated acreage is annual grassland that has been cleared for many years and which retains little or no native vegetation.

Several park properties were recently treated under the NPS WUI funding program where the local fire department and homeowners have been concerned with park vegetation. These areas have been treated in high quality coastal sage, chaparral, and oak woodland habitats. To minimize habitat fragmentation, only those areas that fall within 200' of residential structures will

continue to be maintained as a fuel modification zone; areas within the park core will be allowed to recover.

Ecological Prescribed Fire

Ecological prescribed fire is planned only in annual grassland and oak savanna vegetation types. A maximum of 275 acres/project with a maximum of 4 projects/year is proposed. Because of the low intensity fires that occur in these vegetation types, the size of the fires, and the rapid vegetation recovery, no habitat fragmentation impacts are anticipated.

Strategic Fuel Reduction

It is not possible to evaluate the habitat fragmentation impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk:benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

See A1a Vegetation, page 4-7.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact on the interaction between habitat fragmentation and wildfire impacts because it reduces fire size and the amount of area repeatedly burned in the high fire frequency environment of the Santa Monica Mountains; it is a long-term effect that permanently affects habitat characteristics; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression are adverse due to habitat fragmentation caused by ground disturbance and vegetation destruction. Operational impacts are short-term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts on habitat fragmentation may be of moderate intensity because effects are readily apparent, but limited in extent.

Fuel modification impacts are common to all alternatives. Habitat fragmentation impacts from fuel modification are adverse, long-term, and of moderate intensity. However the majority of the impacts for the project areas covered by this *Draft SMMNRA Fire Management Plan* have occurred from past maintenance activity and are identical among all alternatives, including the no-action alternative. No new fuel modification on parkland is anticipated from new development.

Education and community outreach benefits are identical among all alternatives including the no-action alternative.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to contribute to the adverse interaction between habitat fragmentation and wildfire. Habitat fragmentation impacts from landscape mosaic burning are considered to be adverse, long-term, and of moderate intensity. Increasing the amount of area burned in prescribed fires, as proposed under this alternative, increases the area and distribution of burned acreage across the landscape. This increases the probability of habitat fragmentation impacts by direct fire effects and by increasing the amount of habitat that is at ecological risk of degradation from subsequent wildfires with too short a fire return interval.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts from strategic fuels reduction to habitat fragmentation are unknown and will need to be evaluated with project specific environmental analysis. Strategic fuels reduction would have a positive benefit on habitat fragmentation impacts if the technique were successful in limiting the amount of area burned, thereby increasing the fire rotation interval through more effective control of fire spread. Adverse impacts of habitat fragmentation would be expected if the projects were located in core habitat areas and vegetation were treated by either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire impacts on habitat connectivity are considered to be neutral, short-term and negligible due to mortality in a small number of species and beneficial, long-term, moderate due to improved habitat quality.

Alternative 4 – Mechanical Fuel Reduction

Impacts to habitat connectivity from mechanical fuel reduction on NPS property are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the No-Action Alternative (Alternative 1). Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1), includes the benefits of Alternative 3 and the common impacts of Alternative 4. It includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific EA.

Mitigation Measures

- 1) The NPS and other agencies should work together to identify and protect large, continuous blocks of natural habitat to reduce impacts of habitat fragmentation.
- 2) Fire prevention and suppression techniques should be utilized to reduce the probability of large-scale, catastrophic wildfires in natural areas.
- 3) Additional research and monitoring should be undertaken to further understand the relationship between fire and habitat fragmentation. Top priority research needs include:
 - Effects of fire on wildlife under different fire sizes, shapes and intensities, including wildfire and prescribed fire.
 - Influence of surrounding human-modified landscapes on postfire wildlife recovery patterns.
 - Role and significance of fire as a potential extinction mechanism and edge effect facilitator in fragmented habitats.

IV Impact Topics

A1d Biological Resources – Non-Native/Invasive Species

Threshold Criteria

The impacts of invasive exotic species are analyzed by changes in the structure and composition of the vegetation in the dominant plant community types. Adverse impacts from invasive exotic species are those where non-native species alter the structure and composition of native plant communities and beneficial impacts are those where non-native species are eliminated.

Type of Impact

- Adverse: Non-native species abundance and diversity increases; native species diversity decreases; native community composition, structure, and processes are altered to less complex and/or non-sustainable condition.
- Beneficial: Non-native species abundance and diversity decreases; native species diversity increases; native community composition, structure and processes are restored or retained.

Duration of Impact

- Short-term: Transitory, 2-5 years.
- Long-term: Irreversible, 50-100+ years.

Intensity of Impact

Negligible:	Imperceptible or undetectable effects upon vegetation.
Minor:	Slightly perceptible and localized effects.
Moderate:	Measurable change in plant community structure and composition; changes in ecosystem processes (e.g., fire, nutrient cycling, hydrology) on a localized level.
Major:	Substantial change in plant community structure and composition; changes in ecosystem processes (e.g., fire regime, nutrient cycling, hydrology) on a landscape scale.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Under the existing program of complete wildfire suppression, fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. The current anthropogenically dominated fire environment has drastically reduced the average fire return interval in the Santa Monica Mountains to 32 years.

Invasive plant species occur predominantly in plant communities subject to periodic natural disturbance such as stream channels, in areas in proximity to development (e.g., coastal bluffs, coastal terrace, valley bottoms), and in areas where native species cover and natural regeneration has been displaced, thereby providing an opening for non-native species invasions (e.g., grading, short fire return interval). There is no evidence that in the absence of a non-native propagule source, and with a fire return interval within the range of resiliency of the native plant communities, that fire promotes the establishment of non-native plant species. On the other hand, habitat type conversion of diverse chaparral shrubland to degraded annual grassland interspersed with resprouting laurel sumac from an unnaturally short fire return interval has been documented. Type conversion is believed to shift the fire regime towards more frequent and cooler fires that perpetuate the type-converted community. Wildfire may also act synergistically with other unnatural ecosystem perturbations to exacerbate the problem of non-native plant invasions (e.g., see habitat fragmentation discussion). Wildfire suppression is interpreted as generally beneficial to controlling non-native species to the degree that it limits the amount of area burned by wildfire in the Santa Monica Mountains and the degree to which it increases the average fire rotation interval.

Operational effects can facilitate the establishment of non-native invasive plant species by ground disturbing actions such as constructing fire lines and mopping-up. Additionally operational activities have the potential for spread of weed seed or propagules on equipment. Suppression operations create conditions that are favorable to non-natives which may invade these disturbed areas and displace native species. Depending on the proximity of non-native seed sources, the vegetation type and the operational methods used, the effects may be short lived if there is effective vegetative or seed regeneration of native species. Effects may be long term if the impacts are sufficient to create type converted, permanently degraded habitat types.

Although the use of heavy equipment for fire suppression is prohibited unless authorized by the SMMNRA superintendent, it is a standard tool for agencies charged with fire management on adjacent lands, and would almost certainly be employed in cases where life or property is at risk.

Mechanical Fuel Reduction

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located on the margins of park properties, where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). The vast majority of treated acreage is annual grassland that has been cleared for many years and which retains little or no native vegetation. A number of the sites have non-native perennial weed species that have the potential to spread beyond the fuel modification zone into the adjoining native plant communities (e.g., castor bean, fennel, and tree tobacco). Measures to control these species should be incorporated in the annual fuel modification work plan.

Several park properties were recently treated under the NPS WUI funding program where the local fire department and homeowners have been concerned with park vegetation. These areas have been treated in high quality coastal sage, chaparral, and oak woodland habitats. Fuel modification alters normal vegetation structure and makes the vegetation more susceptible to invasion by non-native annual grasses and forbs. To minimize the spread and permanent establishment of non-native plant species in high quality habitat areas, only those areas that fall within 200' of residential structures will continue to be maintained as a fuel modification zone. The NPS policy on fuel modification will follow that established by the California Department of Parks and Recreation (Appendix A).

Ecological Prescribed Fire

Although prescribed fire is unnecessary for ecological health at the landscape level in the shrubland vegetation types in the Santa Monica Mountains, fire may be an effective tool to control invasive non-native species or to shift the competitive balance in favor of native over non-native species in disturbed or grassland areas. Ecological prescribed fire is being used in Cheeseboro Canyon to reduce the non-native seed bank as part of a native grassland and coastal sage scrub restoration project.

A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire. Areas that are potential restoration sites have been identified by overlaying annual grassland and oak savanna vegetation types onto park properties (Figure 2-2, Table 2-3).

Strategic Fuel Reduction

It is not possible to evaluate the impacts of the strategic fuels reduction alternative on the spread and establishment of invasive plant species without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk:benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

Education provides positive benefits in limiting the impacts of non-native invasive species in the SMMNRA where it is an important element of landscaping and fuel modification education programs.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact on the spread and establishment of non-native plant species because it reduces the amount of area repeatedly burned in the high fire frequency environment of the Santa Monica Mountains; it is a long-term effect that permanently affects the trajectory of vegetation succession; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression are adverse due to ground disturbance, native vegetation destruction, and the potential spread of weed propagules; effects may be short-term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts may be of negligible to moderate intensity because effects can vary from none to measurable and localized, and occur across the landscape with repeated fires.

Impacts from establishment of non-native species due to fuel modification are adverse, long-term, and of moderate intensity. However the majority of the impacts for the project areas covered by this *Draft SMMNRA Fire Management Plan* have occurred from past maintenance activity and are identical among all alternatives, including the No-Action Alternative (Alternative 1). No new fuel modification on parkland is anticipated from new development.

Education and community outreach benefits are identical among all alternatives including the No-Action Alternative (Alternative 1).

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to create adverse impacts from non-native species establishment. Potential non-native species impacts from landscape mosaic burning are considered to be moderate, adverse, and long-term due to potential type conversion from a too-short fire return interval. Increasing the amount of area burned in prescribed fires, as proposed under this alternative, increases the amount of area that is at ecological risk from subsequent wildfires with too short a return interval.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts on non-native species from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Benefits would occur on a landscape level if the technique were successful in limiting the amount of area burned, thereby increasing the fire rotation interval with more effective control of fire spread. Adverse impacts to the areas of treated vegetation would be expected from either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire has the potential to reduce impacts from non-native species and is therefore considered to have beneficial, long-term, moderate impacts.

Alternative 4 – Mechanical Fuel Reduction

Non-native species impacts from mechanical fuel reduction are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the no-action alternative. Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1), includes the benefits of Alternative 3 and the common impacts of Alternative 4. It includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific EA.

Mitigation Measures

Wildfire Suppression - Operational Impacts

- 1) Existing roads, fuel breaks and trails should be used for fire lines; new line construction should be limited to the greatest extent feasible.

Fuel Modification

- 1) All park fuel modification zones should be monitored for the presence of serious invasive plant species. Species known to be aggressive invaders of wildland areas, particularly perennial herbs and shrubs, should be controlled as part of all mechanical fuel treatments. Where topography permits, annual grasslands should be mowed rather than disked.
- 2) Adopt State Park's policy for fuel modification on park properties where it is determined to be necessary to provide protection to private property as a joint agency policy (Appendix A).

Education and Outreach

- 1) The NPS and other agencies should to continue to co-operate and improve outreach methods to inform residents about appropriate fuel modification techniques to preserve native species; the use of appropriate native landscaping; the importance of avoiding invasive non-natives species.
- 2) The NPS and other agencies should to continue to co-operate in all activities that promote fire prevention in order to reduce fire frequency. Road clearing projects should be evaluated for effectiveness and avoid increasing the area occupied by non-native species.

IV Impact Topics

A1e Biological Resources – Rare, Threatened and Endangered Species – Plants

Threshold Criteria

Fire may be a necessary element in the management of some special-status plant species by maintaining open habitat, stimulating reproduction, and affecting competing species. Fire may injure or kill individual plants while the effects on the species as a whole are beneficial because competition has been reduced or openings created. Fire suppression activities can adversely affect special-status species because of ground disturbance, habitat destruction, and plant mortality. Prescribed fires may be detrimental to non-fire adapted species or when the timing, frequency, and intensity of fire are outside of the natural fire cycle to which species are adapted (Hessl and Spackman, 1995).

The majority of plants listed as rare, threatened or endangered in the Santa Monica Mountains are not expected to be adversely impacted by wildfire because they either grow in habitats where fire has limited impact (e.g., rock outcrops, dunes, salt marshes) or they grow in fire adapted habitats and have been subjected to recurring natural fires.

Type of Impact

Adverse:	Viability of known populations and/or potential habitats of special-status species is threatened. May lead to loss of habitat, increased competition by either native or non-native species, cause plant mortality, or reduce and/or prevent reproduction.
Beneficial:	Enhances the viability of populations. May improve habitat conditions, eliminate competitive species (thereby increasing available habitat), or improve reproductive output and success.

Duration of Impact

Short-term:	May immediately affect the population or species, but with no long-term effects to population trends or species viability.
-------------	--

Long-term: May lead to a change in population or species viability — exhibited by a trend towards decline or increase in overall abundance, viability, and/or survival.

Intensity of Impact

Negligible: Imperceptible or undetectable.
Minor: Slightly perceptible and localized, without the potential to affect long-term population viability.
Moderate: Apparent and sufficient to cause a change in abundance, distribution, quantity, or quality of individuals within a population, but effect is short-term; if multiple populations affected, then overall species viability is unaffected.
Major: Substantial and highly noticeable; effect is long-term; affects multiple populations.

Proposed Actions

The majority of sensitive plant species in the Santa Monica Mountains do not occur on NPS land and are therefore not under direct management control by the NPS. In major wildfire events, suppression operations are not under the control of the NPS, but rest with Los Angeles or Ventura County Fire Departments. There is therefore limited potential for direct impact to sensitive plant species from any NPS fire management actions proposed under the alternatives. The NPS does maintain a sensitive species database as part of its role to provide support to other resource agencies and local jurisdictions in the protection of natural resources within the SMMNRA. The NPS therefore performs a predominately advisory role to other agencies whose actions have a greater potential to directly impact sensitive plant populations.

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. The average fire return interval in the Santa Monica Mountains is 32 years, significantly lower than the 100+ interval that would be expected with infrequent natural lightning ignitions. The probability is therefore high that populations of sensitive species will eventually be subjected to wildfire. The majority of plants listed as rare, threatened or endangered in the Santa Monica Mountains are not expected to be adversely impacted by wildfire because they either grow in habitats where fire has limited impact (e.g., rock outcrops, dunes, salt marshes) or they grow in fire-adapted habitats and have been subjected to recurring natural fires. There is no information to determine whether sensitive plant populations have been affected by altered fire regime parameters (frequency, intensity, season, etc.). In general, there is a lack of basic biological data on species response to fire for the sensitive species in the SMMNRA. A priority of the *Fire Management Plan* is to incorporate fire response data into the sensitive species database of the I & M program.

Operational effects associated with wildfire suppression have the potential to significantly impact populations of sensitive plant species. Actions such as constructing fire lines, helispots, staging areas, mop-up and other ground disturbing processes can impact sensitive species by

killing mature plants, by reducing post-fire reproduction through destruction/disturbance of the seed bed, or by destruction/disturbance of underground reproductive structures (e.g., burls, bulbs, rhizomes). Suppression operations also create conditions that are favorable to non-natives which may invade fire lines and compete with sensitive species. Whenever possible, operational impacts should be avoided by informing the incident commander where populations of sensitive plant species occur.

Mechanical Fuel Reduction

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). These areas have been treated for many years. Based on habitat characteristics and past land use, no sensitive plant populations are believed to grow in the existing fuel modification zones. A survey of all fuel modification areas to confirm the absence of sensitive species is recommended.

Ecological Prescribed Fire

Ecological prescribed fire is proposed only in areas of annual grasslands or oak savanna that are depauperate of native species and are dominated by non-natives. No sensitive plant populations grow in the proposed restoration areas and there will be no impacts to sensitive plants from ecological prescribed fire.

Strategic Fuel Reduction

It is not possible to evaluate the sensitive species impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17). Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review that would assess the potential for sensitive species impacts.

Education and Community Support

No community education programs related to sensitive species are proposed.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire is not expected to adversely impact most sensitive plant species, but there is limited data available on species response to fire. Effects potentially associated with changes in fire regime caused by increased anthropogenic ignitions and the counterbalancing influence of fire suppression are unknown due

to lack of data. Wildfire suppression operational effects on sensitive plant species are moderate, adverse, and potentially long-term. Whenever possible, operational impacts should be avoided by informing the incident commander of the location of populations of sensitive plant species.

Fuel modification impacts are common to all alternatives. There are no impacts to sensitive plant species expected from mechanical fuel reduction because no populations are believed to be located within the park's fuel modification areas. No new fuel modification on parkland that might potentially impact sensitive species is anticipated from new development.

No education and community outreach measures related to sensitive species are proposed.

Alternative 1 – No-Action Alternative

The landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact sensitive species because of the larger size of individual projects in chaparral and coastal sage habitats which creates a greater opportunity to include and potentially impact sensitive species habitat within the project area. Actual impacts to particular sensitive plant species from landscape mosaic burning are unknown and can not be analyzed because no geographically specific project sites are identified. The impacts to sensitive plant species from landscape mosaic prescribed burn projects would need to be evaluated with project specific environmental analysis.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to sensitive plant species from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

There are no sensitive plant populations located within areas proposed for ecological prescribed burning and there are therefore no impacts to sensitive plant species.

Alternative 4 – Mechanical Fuel Reduction

There are no impacts to sensitive plant species expected from mechanical fuel reduction because no populations are believed to be located within the fuel modification areas. This will be confirmed by park botanists prior to the 2003 fuel modification.

Conclusions

Alternatives 3 and 4 have no impacts on sensitive plant populations and are therefore superior to the No-Action Alternative (Alternative 1) which has some limited potential to impact sensitive plant species habitat. The impacts of alternative 2 are unknown relative to both the No-Action Alternative (Alternative 1) and Alternatives 3 and 4.

Mitigation Measures

Wildfire Suppression - Operational Impacts

1) Incident Command Consultation

To avoid operational impacts to populations of sensitive plant species, it is necessary that sensitive plant populations be identified and avoided. The geographic location and individual vulnerabilities of sensitive species may not be available to the fire-fighting agencies managing the fire control operations. As with cultural resources information, the NPS should provide for biological consultation to the Incident Command System. At minimum, this should include a qualified biologist with the sensitive species GIS database who can make recommendations to minimize impacts to any sensitive species potentially affected by fire control operations.

Fuel modification

- 1) All fuel modification areas should be surveyed by NPS botanists to confirm that no sensitive species are located in the fuel modification zone.

Information Needs

1) Post-Fire Monitoring Program

With the possible exception of prescribed fire to provide strategic fuels reduction, sensitive plant populations are unlikely to experience fire except as wildland fire. The park should be prepared to monitor any sensitive plant populations that experience wildfire in order to develop basic information on fire effects in these species.

2) Sensitive Species Database

There is a lack of basic biological data for a number of the sensitive species in the SMMNRA. Basic information on species response to fire should be collected through literature review and field observation. Fire response information should be incorporated into the sensitive species database as part of the I & M program.

IV Impact Topics

A1f Biological Resources – Rare, Threatened and Endangered Species – Animals

Threshold Criteria

Like most wildlife in the Santa Monica Mountains, special-status species have adapted to natural fire regimes. Fire control activities may adversely affect special-status species through direct disturbance of animals and habitats. Even management actions designed to benefit habitat, such as prescribed fire, can have inadvertent adverse effects on special-status species.

The distribution of sensitive species was determined based on literature, field observations of park staff, and local resource specialists, and from the ongoing SMMNRA sensitive species surveys.

Type of Impact

- Adverse: Likely to result in declines in the abundance or distribution of a special-status species. This could occur through direct disturbance or mortality, or through destruction or alteration of habitat.
- Beneficial: Likely to protect and/or restore the natural abundance and distribution of a special-status species through protection and restoration of structure, succession, and distribution of habitat.

Duration of Impact

- Short-term: Immediate changes in the abundance and distribution of a special-status species, but a return to the original condition occurs within two generations of that species.
- Long-term: Changes in the abundance and distribution of a special-status species that persist for greater than two generations of that species; continuance of population trend is likely to persist.

Intensity of Impact

- Negligible: Imperceptible or undetectable.
- Minor: Slightly perceptible and limited in extent. Without further actions, effects would reverse, and the species affected would return to their previous conditions.
- Moderate: Readily apparent but limited in extent. Without further actions, effects would eventually reverse, and the species affected would return to their previous conditions.
- Major: Substantial, highly noticeable, and affecting a large area. Changes would not reverse without active management.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. The fire return interval in the Santa Monica Mountains is 32 years, significantly lower than the 100+ interval that would be expected with infrequent natural lightning ignitions. The probability is therefore high that sensitive wildlife species will eventually be subjected to wildfire.

To the extent that data are available, detailed information on the response of individual sensitive species to fire is provided in A5b Rare, Threatened, and Endangered Species – Wildlife, page 3-80.

Mammals

The majority of the park's sensitive mammal species, i.e. the salt marsh ornate shrew and all sensitive bat species, will not be directly impacted by wildfire mortality or habitat loss as their habitats are not susceptible to wildfire. Bats might be indirectly impacted by smoke and changes in food sources but there are no data available. Badgers would be minimally impacted as they would survive wildfire unless caught out of their dens at the time of the fire and their food source remains available after fires.

Birds

Birds that are unlikely to be affected by wildfire are aquatic species, locally extinct or extirpated species, migrants or vagrants, and rare winter residents. Year-round resident birds that would be mostly unaffected directly by wildfire are the osprey, peregrine falcon, and northern harrier, although fire might impact the food resources of the northern harrier and the peregrine falcon. Local breeding birds that are unaffected by wildfire due to their habitat preferences are Belding's savannah sparrow (salt marsh) and the golden eagle (cliffs, large range). Burrowing owls' underground nests in grasslands are also likely to be protected from the direct effects of wildfire.

The following sensitive species nest in habitats that experience severe wildfire and are likely to be impacted by loss of habitat and alterations in food resource availability: mountain quail (dense chaparral); California horned lark (grasslands and open coastal sage scrub); loggerhead shrike (open woodlands, meadows and scrub savanna, clearings); San Diego cactus wren (cactus scrub); southern California rufous-crowned sparrow (sparse, open shrubland, and chaparral); yellow warbler (dense riparian scrub); long-eared owl, Cooper's hawk (oak woodland and riparian woodland). Detailed data on post-fire population impacts are available only for the cactus wren. For the majority of species it is assumed that wildfire impacts are adverse, but the duration and magnitude of the effects are unknown.

Reptiles and amphibians

The coast patchnose snake occurs in rocky outcrops and would therefore be expected to be unaffected by direct wildfire impacts.

Wildfires in riparian areas and the surrounding upland habitat, could adversely affect the following species by loss of riparian vegetation, increased stream temperatures or siltation effects: southwestern pond turtle, California newt, two-striped garter snake, and red-legged frog (Simi Hills). Data on specific impacts are available only for the California newt. Wildfire does not affect the abundance of mature newts, but siltation of breeding habitat causes a significant decline in reproductive success. Loss of ground cover in riparian and oak woodlands may adversely impact the San Diego mountain king snake and silvery legless lizard.

Sensitive reptile species that occur in scrub habitats may prefer the more open habitat created by fire including the San Diego horned lizard (sandy soils), coastal western whiptail, and San Bernadino ringneck snake.

For the majority of sensitive reptile and amphibian species, there are inadequate data to determine the type, duration, and magnitude of wildfire impacts.

Fish

Wildfire can adversely impact steelhead trout through indirect effects including loss of riparian stream cover, increased stream temperatures, and siltation of spawning habitat. The watersheds in which wildfire could impact steelhead are the Malibu, Topanga, and Arroyo Sequit watersheds. The tidewater goby, in the Malibu and Topanga lagoons, can also be adversely impacted by indirect sedimentation impacts to spawning habitat.

Invertebrates

No data on invertebrate responses to wildfire are available.

Because of the high fire frequency in the mountains and the presence of some sensitive species that are at least somewhat adversely impacted by wildfire, fire suppression is interpreted to be generally beneficial to sensitive wildlife species.

Operational effects associated with wildfire suppression have the potential to significantly impact sensitive species habitat. Actions such as constructing fire lines, helispots, staging areas, mop-up, and other ground disturbing processes can destroy habitat elements required by sensitive species. Whenever possible, operational impacts should be avoided by informing the incident commander where important sensitive wildlife habitat occurs.

In major wildfire events, suppression operations are not under the control of the NPS, but rest with Los Angeles or Ventura County Fire Departments. The NPS would perform a predominately advisory role to other agencies whose actions have a greater potential to directly impact sensitive wildlife species.

Mechanical Fuel Reduction

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). These areas have been treated for many years. Based on habitat characteristics and past land use no sensitive wildlife species are believed to use the existing fuel modification zones. A survey of all fuel modification areas to confirm the absence of sensitive species is recommended.

Ecological Prescribed Fire

Ecological prescribed fire is proposed only in areas of annual grasslands or oak savanna that are depauperate of native plant species and are dominated by non-native grasses and forbs. No resident sensitive species that could be directly impacted by prescribed fire are expected to occur in the restoration areas, however all sites would be surveyed for potential sensitive species (e.g. badger, burrowing owl, California horned lark, and loggerhead shrike). Sensitive species that could potentially use the restoration sites for foraging (e.g., northern harrier, burrowing owl) would be minimally impacted because only a small percentage of the total grassland foraging habitat would be burned at one time. Because of the vegetation type, fire intensity, and topography

in the proposed ecological restoration areas, no erosion and subsequent sedimentation would be expected to enter stream systems that could impact sensitive aquatic or riparian species.

Strategic Fuel Reduction

It is not possible to evaluate the sensitive species impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17). Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review that would assess the potential for sensitive species impacts.

Education and Community Support

No community education programs related to sensitive species are proposed.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire may adversely impact some sensitive wildlife species, but there are limited data available on species' response to fire. Effects potentially associated with changes in fire regime caused by increased anthropogenic ignitions and the counterbalancing influence of fire suppression are unknown due to lack of data. Operational effects from wildfire suppression activities are moderate, adverse, and potentially long-term. Whenever possible, operational impacts should be avoided by informing the incident commander of the location of sensitive species habitat.

Fuel modification impacts are common to all alternatives. There are no impacts to sensitive wildlife species expected from mechanical fuel reduction because no populations are believed to be located within the fuel modification areas. No new fuel modification on parkland that might potentially impact sensitive species is anticipated from new development.

No education and community outreach measures related to sensitive species are proposed.

Alternative I – No-Action Alternative

The landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to impact sensitive species because of the larger size of individual projects in chaparral and coastal sage habitats. Actual impacts to particular sensitive wildlife species from landscape mosaic burning are unknown and can not be analyzed because no geographically specific project sites are identified. The impacts to sensitive wildlife species from landscape mosaic prescribed burn projects would need to be evaluated with project specific environmental analysis.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to sensitive wildlife species from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

No sensitive resident species are expected within areas proposed for ecological prescribed burning. Sites will be surveyed to ensure that there are no impacts to sensitive wildlife species.

Alternative 4 – Mechanical Fuel Reduction

There are no impacts to sensitive wildlife expected from mechanical fuel reduction because no populations are believed to be located within the fuel modification areas.

Conclusions

Alternatives 3 and 4 have no impacts on sensitive wildlife and are therefore superior to the No-Action Alternative (Alternative 1) which has some limited potential to impact sensitive species habitat. The impacts of Alternative 2 are unknown relative to both the No-Action Alternative (Alternative 1) and Alternatives 3 and 4.

Mitigation Measures

Wildfire Suppression - Operational Impacts

1) Incident Command Consultation

To avoid operational impacts to sensitive wildlife species, it is necessary that sensitive wildlife habitat features and locations be identified and avoided. The geographic location and individual vulnerabilities of sensitive species may not be available to the firefighting agencies managing the fire control operations. As with cultural resources information, the NPS should provide for biological consultation to the Incident Command System. At minimum, this should include a qualified biologist with the sensitive species GIS database who can make recommendations to minimize impacts to any sensitive species potentially affected by fire control operations.

2) Sensitive habitats that could be impacted by operational activities should be identified by NPS on a GIS database and made available at the Incident Command Post. Fire operations should avoid sensitive habitat areas, especially streams and woodlands.

3) Trees should be preserved during line construction and other operations requiring vegetation clearance.

Ecological Prescribed Fire

- 1) Survey all areas for the presence of resident sensitive wildlife species.

Information Needs

1) Post-Fire Monitoring Program

With the possible exception of prescribed fire to provide strategic fuels reduction, sensitive wildlife populations are unlikely to experience fire except as wildland fire. The park should be prepared to monitor any sensitive wildlife populations that experience wildfire in order to develop basic information on fire effects in these species.

2) Sensitive Species Database

There is a lack of basic biological data for a number of the sensitive species in the SMMNRA. Basic information on species response to fire should be collected through literature review and field observation. Fire response information should be incorporated into the sensitive species database as part of the I & M program.

IV Impact Topics

A2 Soils and Geology

Threshold Criteria

Water resources and soils are interrelated in their reactions to fire. Effects upon soils and water quality are assessed by considering the likely scale of the effect — whether fire would affect all or part of the watershed slope (ridge, mid-slope, bottom) — and as a result, the likely effect upon water yield, peak flows, sediment yield, nutrient yield, and/or stream system response. Soils and water quality effects are driven by the magnitude of storm events following fire and the time to restore normal vegetative cover. These effects are highly stochastic due to the enormous annual variation in rainfall amount and intensity. The frequency of events will also be a significant factor.

Type of Impact

- Adverse: Effects outside the natural range of variability for watershed conditions (water yield, peak flows, sediment yield, nutrient yield, or stream system response, frequency of occurrence).
- Beneficial: Effects within the natural range of variability for watershed conditions (water yield, peak flows, sediment yield, nutrient yield, or stream system response, frequency of occurrence).

Duration of Impact

- Short-term: Transitory; < 5 years; < one El Nino cycle.
- Long-term: Irreversible; 50+ years; > one El Nino cycle.

Intensity of Impact

Negligible:	Imperceptible or undetectable.
Minor:	Slightly perceptible and localized, effects do not move beyond the affected area
Moderate:	Measurable effects can be detected beyond the affected area, but are transitory, reversible, and within the historic range of variability for the ecosystem.
Major:	Effects are substantial, highly noticeable, at the watershed scale; irreversible; or outside the range of historic ecosystem variability.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the Santa Monica Mountains National Recreation Area. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. Fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. The fire return interval is 32 years, significantly lower than the 100+ interval that would be expected with infrequent natural lightening ignitions. Large wildfires can impact several small watersheds and/or a large percentage of the larger watersheds in a single event. They dramatically affect soils and water quality, the magnitude of which are driven by the size of the fire, the magnitude of storm events following fire, and the time to restore normal vegetative cover. Wildfire suppression is therefore interpreted as beneficial in limiting the soils, geology, and watershed impacts associated with wildfires to the degree that it limits the amount of area burned with increased wildfire frequency.

Suppression is effective in limiting the size of fires under mild and moderate climactic conditions, but is less successful for fires that start in extreme weather conditions. More area may therefore burn under intense fire conditions which exacerbate soil and geology fire impacts. In the absence of controlling fire to reduce fire frequency starts (especially arson and power lines), there is little that can be done to reduce this impact.

Operational actions such as constructing fire lines, helispots, staging areas, mop-up, and other ground disturbing processes can expose soils and make them susceptible to erosion. Depending on the effectiveness of rehabilitation methods, and whether type conversion permanently degrades shrubland habitat types, these operations may create either short- or long-term soil impacts. The use of heavy equipment has the potential to be especially damaging. Although the use of heavy equipment for fire suppression is prohibited unless authorized by the SMMNRA superintendent, it is a standard tool for agencies charged with fire management on adjacent lands, and would almost certainly be employed in cases where life or property is at risk.

Mechanical Fuel Reduction

Mechanical fuel reduction can create soil erosion impacts by exposing soils through vegetation removal and by increasing the potential for mass movement by removing deep rooted shrubs and

type converting to grasslands. The effects will depend on the amount of area treated, the slope angle, the soil type, the vegetation type and the amount of cover retained. On very steep slopes workers can dislodge significant amounts of surface soil as they move across the slopes cutting vegetation; these impacts are often repeated on an annual basis to meet fire department fuel modification requirements.

A total of 90 acres on NPS property is treated by mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). The vast majority of treated acreage is annual grassland that has been cleared for many years. These areas are either mowed, turned over with a tractor-pulled disker, or on steep slopes, weed-whipped. The areas that are mowed have limited erosion potential because they are generally located on very gentle slopes and the annual grasses provide vegetation cover that limits surface erosion. Weed-whipped areas similarly have limited erosion potential because they have a cover of annual grasses, even though the slopes are steeper. The disked areas, in contrast, are potentially susceptible to erosion because soil is turned over and exposed.

Several park properties were recently treated under the NPS WUI funding program where the local fire department and homeowners have been concerned with park vegetation. These areas have been treated in high quality coastal sage, chaparral and oak woodland habitats. Mechanical fuel reduction in these areas removes dead material and flashy fuels, reduces the density of shrubs, and limbs up trees and large shrubs. Where fuel modification of shrublands or woodlands is repeated annually, grasses normally invade. If grasses are established and annually weed-whipped, surface erosion is generally not a major problem. However, on some of the very steep slopes annual fuel modification may dislodge significant amounts of surface soil as workers move across the slopes. On very steep slopes where shrubs have been replaced by annual grasses the potential for shallow soil slips in intense rainfall events also increases. To minimize soil erosion and the potential for slope failure, only those areas that fall within 200' of residential structures will continue to be maintained as a fuel modification zone. The NPS policy on fuel modification will follow that established by the California Department of Parks and Recreation (Appendix A).

Ecological Prescribed Fire

Ecological prescribed fire is proposed only in grassland areas with level or relatively gentle slopes. A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire. The prescribed burn areas represent only a tiny fraction of the total watershed area in which the prescribed burns are proposed. No erosion from areas of prescribed fire is anticipated because the burned stubble that remains after the low fire intensities of the grassland burns provides soil protection from erosion. The lack of steep slopes further limits the potential for erosion.

Strategic Fuel Reduction

It is not possible to evaluate the soil or geologic impacts of the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

Education will have positive benefits in reducing erosion and the potential for shallow slope failures in the SMMNRA where it can be used to teach residents appropriate fire safe landscape management techniques. These include appropriate fuel modification techniques that preserve native species; use of appropriate native landscaping; avoidance of non-native plant that increase fuel load; limited use of irrigation; slope preservation; and appropriate structure siting to limit the fuel modification zone.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact to soils and geology because it reduces the amount of area exposed to erosion from wildfires; it is a short-term effect; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression are adverse due to ground disturbance and vegetation destruction; they may be short-term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts are of minor intensity because the effects are mostly localized.

Fuel modification impacts are also common to all alternatives. Impacts to soils and geology from fuel modification are adverse, long-term, and of minor to moderate intensity. However the majority of the impacts for the project areas covered by this *Draft SMMNRA Fire Management Plan* have occurred from past maintenance activity and are identical among all alternatives including the No-Action Alternative (Alternative 1). No new fuel modification on parkland is anticipated from new development.

Education and community outreach benefits are beneficial, long-term, of minor to moderate intensity and are identical among all alternatives including the No-Action Alternative (Alternative 1).

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994

Fire Management Plan (existing program) has the greatest potential to directly impact soils and geology from erosion and indirectly, from soil impacts associated with type conversion. Potential impacts to soils from landscape mosaic burning are considered to be minor to moderate, adverse, and short-term.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to soils and geology from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Reduced soil erosion would occur on a landscape level if the technique were successful in limiting the amount of area burned. Adverse effects from erosion and mass movement are potential impacts in the areas of treated vegetation from either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Impacts to soils from ecological prescribed fire are neutral, short-term and minor in grassland ecosystems.

Alternative 4 – Mechanical Fuel Reduction

Impacts to soils from mechanical fuel reduction are adverse, short- to long-term, and minor to moderate, but are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the No-Action Alternative (Alternative 1). Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1); it shares in common the neutral effects of Alternative 3 and the adverse impacts of Alternative 4; and it includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific EA.

Mitigation Measures

Wildfire Suppression - Operational Impacts

- 1) Existing roads, fuel breaks and trails should be used for fire lines; new line construction should be limited to the greatest extent feasible.

Fuel Modification

- 1) Work with local jurisdictions to require structure siting to be setback from steep slopes and ridgetops to avoid shrub removal and annual fuel modification on steep slopes.

- 2) The NPS and other agencies should work together to identify the amount of fuel modification required to protect structures from radiative heat loss or from loss due to direct flame impingement. The NPS should analyze the potential cumulative habitat impacts from fuel modification that exceeds the amount necessary to protect structures (e.g. 100' vs. 200').

Education and Outreach

- 1) The NPS and other agencies should to continue to co-operate and improve outreach methods to inform residents about appropriate fuel modification techniques to preserve native species; the use of appropriate native landscaping; the importance of limiting non-natives that increase fuel load; the importance of limiting irrigation; the importance of preserving slope vegetation; and appropriate structure siting to limit the size of the required fuel modification zone.

IV Impact Topics

A3 Water Resources and Wetlands

Threshold Criteria

A programmatic approach has been developed to minimize wetland impacts from NPS activities. The protection of wetlands is facilitated through Executive Order 11990, Protection of Wetlands; *NPS Director's Order 77-1*, Wetland Protection and its accompanying Procedural Manual 77-1 (DO 77-1 and PM 77-1); Clean Water Act, Section 404; and the "no net loss" goal outlined by the White House Office on Environmental Policy in 1993. Executive Order 11990 requires that leadership be provided by involved agencies to minimize the destruction, loss, or degradation of wetlands. *NPS Director's Order 77-1* and Procedural Manual 77-1 provide the procedural structure in which Executive Order 11990 may be implemented. Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act authorize the U.S. Army Corps of Engineers to grant permits for construction and disposal of dredged material in waters of the United States.

Potential wetlands are identified in the SMMNRA GIS database from the 1) vegetation map that identifies wetland and riparian vegetation types and 2) SMMNRA stream survey. It is assumed for purposes of analysis that all wetland and riparian communities on the vegetation map are likely to be classified as wetlands in future delineations of wetlands in the park. This information therefore provides a conservative and broad estimate of potential wetlands in the SMMNRA.

Impacts were assessed with two criteria in mind:

- Federal laws, regulations, and executive orders; similar state laws (for example, the California Endangered Species Act); or NPS management policies.
- Projected impacts on the natural history of a species or the known sensitivities of a habitat.

The assessment of fire management impacts also needs to occur within the context of wetland condition and natural disturbance processes. For this analysis, it was assumed that the greater the size of a wetland community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes.

Type of Impact

- Adverse: Degrades the size, integrity, or connectivity of wetlands; disrupts normal biophysical wetland processes; degrades natives species diversity, structure and composition.
- Beneficial: No detrimental effects; enhances native biophysical wetland processes; enhances the size, integrity, or connectivity of wetlands; enhances natives species diversity, structure and composition.

Duration of Impact

- Short-term: Transitory.
- Long-term: Irreversible.

Intensity of Impact

Three primary measures were used to evaluate the intensity of impacts on wetlands: the size and type of the wetland, the integrity of the wetland, and the connectivity of the wetland to adjacent habitats.

- Negligible: Imperceptible or not detectable.
- Minor: Slightly detectable, localized within a small area, and would not affect the overall viability of wetlands in the park.
- Moderate: Measurable but could be reversed.
- Major: Substantial, highly noticeable, and could be permanent.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. Fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. The average fire return interval is 32 years, significantly lower than the 100+ interval that would be expected with infrequent natural lightening ignitions. Large wildfires can impact several small watersheds and/or a large percentage of the larger watersheds in a single event. Wildfires affect water quality by increasing nutrients, sediments, and potentially temperatures, as well as altering stream morphology. In general, the greater the percentage of the watershed or drainage that is burned, the greater the impact on streams and wetlands. Wildfire suppression is therefore interpreted as beneficial in limiting wildfire impacts to water resources to the degree that suppression limits the amount of area burned.

Operational actions such as constructing fire lines, helispots, staging areas, mop-up, and other ground disturbing processes can affect water resources if they are located in proximity to streams or other wetlands. The use of heavy equipment has the potential to be especially damaging. Although the use of heavy equipment for fire suppression is prohibited unless authorized by the SMMNRA superintendent, it is a standard tool for agencies charged with fire management on adjacent lands, and would almost certainly be employed in cases where life or property is at risk.

Mechanical Fuel Reduction

Mechanical fuel reduction can impact water resources if it is located in proximity to streams or wetlands by causing erosion or removal of riparian/wetland vegetation.

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). None of these sites is located in proximity to streams or other wetlands.

Ecological Prescribed Fire

Ecological prescribed fire is proposed only in grassland areas with level or relatively gentle slopes. A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire. The prescribed burn areas represent only a tiny fraction of the total watershed area in which the prescribed burns are proposed. No erosion from areas of prescribed fires is anticipated because the burned stubble that remains after the fire intensities of the grassland burns provides soil protection from erosion. The lack of steep slopes further limits the potential for erosion. Any potential nutrient impacts would be negligible and transitory.

Strategic Fuel Reduction

It is not possible to evaluate the impacts of the strategic fuels reduction alternative on water resources or wetlands without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk:benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

See A1a Vegetation, page 4-4; and A2 Soils and Geology, page 4-34.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a beneficial impact to water resources because it reduces the amount of area exposed to erosion and runoff from wildfires; it is a short-term effect; it has a moderate impact in that it is effective for small to moderate fires, but may not be effective in preventing the largest fires. Operational impacts of wildfire suppression if they are located in proximity to streams or other wetlands may be adverse due to erosion from ground disturbance, channel alteration or vegetation destruction; they may be short-term or long-term depending on the vegetation type, operational methods, and post-fire rehabilitation treatment; operational impacts are of minor or moderate intensity because the effects are mostly localized, but may be carried downstream.

Fuel modification impacts are also common to all alternatives. There are no impacts to water resources from ongoing fuel modification activities which are identical among all alternatives including the No-Action Alternative (Alternative 1). No new fuel modification on parkland that might impact water resources is anticipated from new development.

Education and community outreach benefits are beneficial, long-term, of minor to moderate intensity and are identical among all alternatives including the No-Action Alternative (Alternative 1).

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to impact water resources by increasing nutrient and sediment runoff to streams and coastal wetlands. Potential impacts to water resources from landscape mosaic burning are considered to be minor to moderate, adverse, and short-term.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to water resources from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Improved water quality of water resources would occur on a landscape level if the technique were successful in limiting the amount of area burned. Adverse impacts from erosion due to loss of vegetative cover are potential impacts in the areas of treated vegetation from either mechanical clearing or a high frequency prescribed fire return interval.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Impacts to water resources from ecological prescribed fire are neutral, short-term and minor in grassland ecosystems.

Alternative 4 – Mechanical Fuel Reduction

Impacts to water resources from mechanical fuel reduction are considered to be negligible because the work is not located in proximity to streams or wetlands and is an ongoing activity with no increase in the amount of affected area over the no-action alternative. Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1); it shares in common the neutral effects of Alternative 3 and the adverse impacts of Alternative 4; and it includes strategic fuel modification as a fire management technique which has both potential benefits and adverse impacts that will need to be evaluated with a project-specific EA.

Mitigation Measures

Wildfire Suppression - Operational Impacts

- 1) Sensitive riparian or other wetlands that could be impacted by operational activities should be identified by NPS on a GIS database and made available at the Incident Command Post. Fire operations should avoid stream and wetland areas.
- 2) Fire lines should be restored to natural grade and to conditions that will encourage native plant growth and avoid weed invasions.

Fuel Modification

- 1) Fuel modification should be avoided in riparian areas and a 100' minimum buffer area provided.

IV Impact Topics

A4 Coastal Resources

Sedimentation from major storm events following fires has the potential to bury rocky marine substrate. Loss of rocky bottom habitat is considered to be a significant impact because it is a loss of regional biodiversity due to the less productive nature of sandy bottom habitat and the limited distribution of rocky bottom habitat (Ambrose et al., 1996). It has not been determined if the suspended sediments observed in the water column off the Malibu Coast is due to re-suspension of bottom sediments or to increased rates of terrestrial erosion. There are no data available to determine if sediment sources from the land are affecting the amount of rock substrate and if the pulse of sediments from post fire years with high rainfall is a contributing factor to the fluctuation in kelp bed distribution and population size.

Because there is inadequate information available to know whether fire sediments have an

impact on coastal resources, this impact topic is not analyzed with respect to individual alternatives. In general, the relative impact to coastal resources would be expected to parallel the conclusions of the water resources/wetlands analysis because the same processes affect the two resources.

Mitigation Measures

Information Needs

Additional research and monitoring should be undertaken to understand the relationship between fire-derived sediments and rocky habitat including:

- Are the suspended sediments observed in the water column off the Malibu Coast due to re-suspension of bottom sediments or to increased rates of terrestrial erosion?
- Is the pulse of sediments from post fire years with high rainfall is a contributing factor to the fluctuation in kelp bed distribution and population size?

IV Impact Topics

A5 Paleontological Resources

Threshold Criteria

Type of Impact

Adverse: Degrades or destroys paleontological resources.
Beneficial: Preserves paleontological resources for the future.

Duration of Impact

Short-term: May temporarily affect fossil resources, but with no long-term effects.
Long-term: Permanently affects fossil resources.

Intensity of Impact

Negligible: Imperceptible or undetectable.
Minor: Affects a fraction of a local formation; limited effect on resources with low sensitivity.
Moderate: Affects resources of particular scientific value; affects a substantial portion of a particular formation.
Major: Affects the majority of an entire formation.

Proposed Actions

The NPS has recently completed a survey of paleontological resources within the SMMNRA. These resources occur on both parkland and private property. In major wildfire events, suppres-

sion operations are not under the control of the NPS, but rest with Los Angeles or Ventura County Fire Departments. The NPS therefore performs a predominately advisory role to other agencies whose actions have a greater potential to directly impact paleontological resources.

Wildfire Suppression

The average fire return interval in the Santa Monica Mountains is 32 years, and the probability is therefore high that surface paleontological resource will eventually be subjected to wildfire. There is no information to evaluate the direct damage to paleontological resources from wildfire. It is presumed to be relatively limited as fossils would need to occur at the surface and to be covered with high fuel loads. Fossils may be lost or exposed as the result of postfire erosion which can be significant in heavy rainfall years following fires. Fossil may also be exposed to collectors or vandals when vegetative cover is lost.

Operational effects associated with wildfire suppression have the potential to significantly impact fossil resources, especially those operations that use heavy equipment for activities such as constructing fire lines, helispots, staging areas, mop-up, and other ground disturbing processes. Whenever possible, operational impacts should be avoided by informing the incident commander where sensitive paleontological resources occur.

Mechanical Fuel Reduction

A total of 90 acres on NPS property is treated with mechanical fuel reduction. These sites are located at the wildland urban interface where pre-existing development requires fuel modification on parkland to provide a defensible space around structures on adjoining private property or around park structures (Figure 2-1, Table 2-4). No paleontological resources are known from these areas.

Ecological Prescribed Fire

Ecological prescribed fire is proposed only in areas of annual grasslands or oak savanna. No surface paleontological resources that might be impacted by prescribed fire are known from the proposed restoration areas.

Strategic Fuel Reduction

It is not possible to evaluate the impacts to paleontological resources from the strategic fuels reduction alternative without a geographically specific project proposal. The analytical procedure required to evaluate the potential risk: benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17). Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review that would assess the potential for paleontological resources impacts.

Education and Community Support

No community education programs related to paleontological resources are proposed.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire may have a minor direct impact on paleontological resources from heat damage, but there are limited data available to evaluate this potential impact. Wildfire suppression operational impacts on paleontological resources are potentially minor to moderate, adverse, and long-term. Whenever possible, operational impacts should be avoided by informing the incident commander of the location of populations of sensitive paleontological resources.

Fuel modification impacts are common to all alternatives. There are no impacts to paleontological resources expected from mechanical fuel reduction. No new fuel modification on parkland that might potentially impact paleontological resources is anticipated from new development.

No education and community outreach measures related to paleontological resources are proposed.

Alternative 1 – No-Action Alternative

The landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact paleontological resources because of the larger size of individual projects in chaparral and coastal sage habitats which creates a greater opportunity to include and potentially impact areas of paleontological resources within the project area. Actual impacts to particular paleontological sites from landscape mosaic burning are unknown and can not be analyzed because no geographically specific project sites are identified. The impacts to paleontological resources from landscape mosaic prescribed burn projects would need to be evaluated with project specific environmental analysis.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to paleontological resources from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

There are no surface paleontological resources located within areas proposed for ecological prescribed burning and there are therefore no impacts to paleontological resources anticipated from ecological prescribed burning.

Alternative 4 – Mechanical Fuel Reduction

There are no impacts to paleontological resources expected from mechanical fuel reduction because no paleontological resources are located within the fuel modification areas.

Conclusions

Alternatives 3 and 4 have no impacts on paleontological resources and are therefore superior to the No-Action Alternative (Alternative 1) which has some limited potential to adversely impact paleontological resources. The impacts of Alternative 2 are unknown relative to both the No-Action Alternative (Alternative 1) and Alternatives 3 and 4.

Mitigation Measures

Wildfire Suppression – Operational Impacts

1) **Incident Command Consultation**

To avoid operational impacts to paleontological resources, it is necessary that paleontological resources be identified and avoided. The geographic location and individual vulnerabilities of paleontological resources may not be available to the firefighting agencies managing the fire control operations. As with cultural and biological resources information, the NPS should provide for paleontological resources consultation to the Incident Command System. At minimum, this should include a qualified GIS specialist with the paleontological resources GIS database who can make recommendations to minimize impacts to any paleontological resources potentially affected by fire control operations.

- 2) Areas with fossil resources that might be exposed and vandalized following wildfire should be closed to public access and monitored by enforcement personnel.

Information Needs

1) **Post-Fire Monitoring Program/ Paleontological Database**

Following fire, the park should be prepared to survey appropriate formations within burn areas and areas of erosion or slope failure for the presence of fossil deposits that were previously inaccessible.

IV Impact Topics

A6 Air Quality

Threshold Criteria

Fire management activities could potentially affect air quality in the Santa Monica Mountains National Recreation Area through smoke emissions from wildland and prescribed fires. Pollutants found in smoke emissions include suspended particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), methane (CH₄), carbon monoxide (CO), nitrogen oxides (NO_x), and carbon dioxide (CO₂).

Per Title 17 of the California Code of Regulations, Subchapter 2 Smoke Management Guidelines

for Agricultural and Prescribed Burning (2001), the Guidelines are to provide direction to air pollution control and air quality management districts (air districts) in the regulation and control of prescribed burning in California. The Guidelines are intended to provide for the continuation of prescribed burning, as a resource management tool and provide increased opportunities for prescribed burning, while minimizing smoke impacts on the public. The regulatory actions called for are intended to assure that each air district has a program that meets air district and regional needs.

The park must comply with the requirements of the South Coast Air Quality Management District for Los Angeles County and the Ventura County Air Pollution Control District for Ventura County before prescribed burn projects are ignited. Special requirements for prescribed burning in wildland fuels are described in the *Fire Management Plan* in the Fuels Management section.

Potential air pollutants associated with wildland and prescribed fire include particulate matter (PM10, suspended particulate and PM2.5, fine particulate matter), carbon monoxide (CO), carbon dioxides (CO2) nitrogen oxides (NOx), volatile organic compounds (VOC, total hydrocarbons). To evaluate smoke impacts associated with specific projects, emissions for PM-10 are calculated as a proxy for other air pollutants for the purposes of analyzing the relative air quality impacts of the different alternatives.

Table 4-1 Particulate Matter Emissions

PM-10 Emissions Calculations for Piles

1. Choose the pile size most representative of the piles on your burn site.
2. Multiply the number of piles in your project with the corresponding "Tons of PM10/Pile" value to get the total PM-10 tonnage.

PM10 EMISSIONS FOR SPECIFIED PILE SIZES		
Pile Size (in feet)	Pile Tonnage	Tons of PM10/Pile
4' diameter x 3' height	0.056	0.0005
5' diameter x 4' height	0.12	0.001
6' diameter x 5' height	0.21	0.002
8' diameter x 6' height	0.45	0.004
10' diameter x 6' height	0.71	0.007
12' diameter x 8' height	1.3	0.01
15' diameter x 8' height	2.1	0.02
20' diameter x 10' height	4.7	0.04
25' diameter x 10' height	7.4	0.07
50' diameter x 10' height	29	0.3

- Pile Tonnage calculated using paraboloid volume formulae multiplied by 30 lbs/cu.ft., multiplied by 0.2 packing ratio^b
- U.S. Forest Service's Conformity Handbook, Table 6 – PM10 Emissions Factor of 19.0 pounds/ton of fuel burned – average pile and burn slash

Revised 2/13/2001

a. Formula used for Paraboloid Volume (cu.ft.) = $3.1416 \times [\text{height} \times (\text{diameter})^2] / 8$ (see Reference b. below).

b. USDA (2/1996). Forest Service General Technical Report. Report Number: PNW-GTR

Table 4-2 PM 10 Emission Calculation For Burning of Multiple Fuel Types 1, 2

Section 80160 (b) of Subchapter 2 Smoke Management Guidelines for Agricultural and Prescribe Burning, Title 17, California Administrative Code states, “requires the submittal of smoke management plans for all burn projects greater than 10 acres in size or estimated to produce more than 1 ton of particulate matter”. To determine what the particulate matter (PM 10) amount is of your burn project please use the equation below and review the following examples.

Information needed for PM 10 Calculations:

- a. VT = Vegetation type
- b. ACRES VT = Estimated number of acres for VT
- c. FL est. = Estimated fuel loading in VT TONS per ACRE
- d. EV = PM10 emission/ton of fuel

Calculating PM10 Emissions from Prescribed Burning of multiple vegetation types:

PM10 ton(s) emissions per VT = (number of acres VT₁) (FL tons per acre) [Emission Value (EV)] = _____ lbs(s)/VT

PM10 ton(s) emissions per VT = (number of acres VT₂) (FL tons per acre) [Emission Value (EV)] = _____ lbs(s)/VT

Sum Total is the Estimated PM 10 for the project = _____ lbs(s)/project

VEGETATION TYPE(S)	ACRES (VT)	x	FL est.	x	EV	PM10 EMISSIONS (lbs)
Basing Sage/Low Sage	(_____)	x	(_____)	x	(0.010) =	_____
Ceanothus	(_____)	x	(_____)	x	(0.010) =	_____
Chamise	(_____)	x	(_____)	x	(0.009) =	_____
Grass/Forb	(_____)	x	(_____)	x	(0.007) =	_____
Hackberry Oak	(_____)	x	(_____)	x	(0.005) =	_____
Hardwood (Stocked)	(_____)	x	(_____)	x	(0.003) =	_____
Hardwood (Non-stocked)	(_____)	x	(_____)	x	(0.003) =	_____
Live Oak (Canyon)	(_____)	x	(_____)	x	(0.007) =	_____
Live Oak (Interior)	(_____)	x	(_____)	x	(0.007) =	_____
Mixed Chaparral/Montane	(_____)	x	(_____)	x	(0.008) =	_____
Oak (White)	(_____)	x	(_____)	x	(0.003) =	_____
Wet Meadow	(_____)	x	(_____)	x	(0.004) =	_____
Willow	(_____)	x	(_____)	x	(0.007) =	_____

Sum Total of the Estimated PM10 for the project in tons/project = _____

1. See Table 3 on next page for values used to calculate EVs.

2. For vegetation types not listed, contact Air District for assistance with determining appropriate emission factors.

Table 4-3 Emission Values (EV) For Prescribed Burns of Various Vegetation Types*

Estimated PM10 emission values for various vegetation types =

$$(\% \text{ combustion}) \times (\text{PM10 emission lbs/ton}) \times (1 \text{ ton}/2000 \text{ lbs})^*$$

EMISSION VALUE			PM Emissions			PM10	
VEGETATION	% Combustion		(lbs/ton fuel)		Conversion Factor	PM 10 (lbs/emissions /ton fuel)	
Basing Sage/Low Sage	= (1.0)	×	(20.17 lbs/ton)	×	(1 ton/2000 lbs)	= 0.010	
Ceanothus	= (1.0)	×	(20.17 lbs/ton)	×	(1 ton/2000 lbs)	= 0.010	
Chamise	= (0.9)	×	(20.17 lbs/ton)	×	(1 ton/2000 lbs)	= 0.009	
Grass/Forb	= (1.0)	×	(15 lbs/ton)	×	(1 ton/2000 lbs)	= 0.007	
Hackberry Oak	= (0.4)	×	(25 lbs/ton)	×	(1 ton/2000 lbs)	= 0.005	
Hardwood (Stocked)	= (0.4)	×	(15 lbs/ton)	×	(1 ton/2000 lbs)	= 0.003	
Hardwood (Non-stocked)	= (0.4)	×	(15 lbs/ton)	×	(1 ton/2000 lbs)	= 0.003	
Live Oak (Canyon)	= (0.6)	×	(25 lbs/ton)	×	(1 ton/2000 lbs)	= 0.007	
Live Oak (Interior)	= (0.6)	×	(25 lbs/ton)	×	(1 ton/2000 lbs)	= 0.007	
Manzanita (Productive Brush)	= (0.9)	×	(20.17 lbs/ton)	×	(1 ton/2000 lbs)	= 0.009	
Mixed Chaparral/Montane	= (0.8)	×	(20.17 lbs/ton)	×	(1 ton/2000 lbs)	= 0.008	
Oak (White)	= (0.4)	×	(15 lbs/ton)	×	(1 ton/2000 lbs)	= 0.003	
Wet Meadow	= (0.6)	×	(15 lbs/ton)	×	(1 ton/2000 lbs)	= 0.004	
Willow	= (0.6)	×	(25 lbs/ton)	×	(1 ton/2000 lbs)	= 0.007	

* Percent combustion and PM10 emission factors for various fuel types derived from Table 8, Section 6, "Air Quality Conformity Handbook" from the USDA-Forest Service Air Resources / Fire Management Pacific Southwest Region dated November 1995.

** These are the vegetation's estimated emissions values(EV) from the vegetation type as determined above to be use when the burn operator provides the vegetation's fuel loading estimate per acre.

*** For additional information on emissions factors, see EPA document AP-42: "Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Area Sources," Fifth Edition, AP-42, January 1995, U.S. EPA. Table 2.5-5.

Burn Timing: Preferred burn season for the fire is late spring early summer. Burn objectives are to negatively impact the exotic seed source while burning during the early stages of curing or drying. Hours of the burn or ignition will not take place before 0900 and will be complete before 1600.

The degree of impact to air quality is rated by the following threshold criteria:

Type of Impact

Beneficial: Reduces emissions or lowers pollutant concentrations.
Adverse: Increases emissions or raises pollutant concentrations.

Duration of Impact

Short-term: Associated with the duration of a specific fire event.
Long-term: Emissions persist beyond the season in which a specific fire event occurred.

Intensity of Impact

Negligible: Less than 5% increase or decrease compared to the existing program.
Minor: 5 to 20% increase or decrease compared to the existing program.
Moderate: 21 to 50% increase or decrease compared to the existing program.
Major: 50% increase or decrease compared to the existing program.

The relative impacts of the four alternatives on air quality are compared by calculating the suspended particulate emissions (PM10) expected under alternative burn scenarios (Table 4-4). For the purposes of the analysis it is assumed that particulate emissions are proportional to the other air pollutants produced in smoke emissions. The amount of particulates generated by different size wildfires are estimated by assuming the heaviest fuel type for small fires (10 acres) and assuming a mix of vegetation types in the proportions in which they occur in the Santa Monica Mountains for moderate and large wildfires (1000 and 10,000 acres).

Table 4-4 Particulate Emissions (PM10) For Prescribed Burning Alternatives

	Area (acres) ¹	Fuel load (tons/acre)	EVI (lbs emissions/ ton fuel)	PM 10 ² (lbs)
Alternative 1				
<i>Landscape mosaic prescribed burning</i>				
Sage	1500	5	0.01	75.0
Chamise	1500	17	0.009	229.5
Ceanothus	1500	31	0.01	465.0
Alternative 2				
<i>Strategic prescribed burn</i> (2 maximum/year)				
Sage	150	5	0.01	7.5 (15)
Chamise	150	17	0.009	23.0 (26)
Ceanothus	150	31	0.01	46.5 (93)
Alternatives 2, 3				
<i>Ecological prescribed burn</i> (4 maximum/year)				
Grass/forb	275	2	0.007	3.9 (15.6)
All Alternatives				
<i>Wildfire suppression</i>				
10 acres				
Ceanothus	10	31	0.01	3.1
1000 acres				
Grass/forb (6%)	60	2	0.007	0.8
Sage (26%)	260	5	0.01	13.0
Chamise (3%)	30	17	0.009	4.6
Ceanothus (65%)	650	31	0.01	201.5
Total				219.9
10,000 acres				
Grass/forb (6%)	600	2	0.007	8.4
Sage (26%)	2600	5	0.01	130.0
Chamise (3%)	300	17	0.009	45.9
Ceanothus (65%)	6500	31	0.01	2015.0
Total				2199.3

¹ Area is the maximum size of individual projects in one year.

² PM10 values are for one project at the maximum proposed size, the PM10 values in parentheses are the values for the proposed maximum number of projects in one year.

Proposed Actions

Wildfire Suppression

Wildfire suppression occurs for all wildfires within the SMMNRA. Under the existing program of complete wildfire suppression, fires occur that range in size from 0.3 acres to 43,043 acres, with a median fire size of 76 acres. A median size fire (with mixed fuel) will generate an estimated 18 lbs of particulates, and a large fire (10,000 acres) will generate 2199 lbs of particulates. Large fires are an infrequent, but re-occurring event that will occur despite the most intensive suppression efforts. Suppression is effective in limiting the size of fires under mild and moderate climactic conditions, and therefore reduces the total wildfire emissions for fires that start in the less extreme weather conditions. Total emissions from wildfires depend on atmospheric conditions as well as fire size, however. Dispersion of pollutants may occur more quickly under the more severe (high wind) conditions likely to occur in large fires than under conditions when fires are more easily controlled and remain smaller.

Mechanical Fuel Reduction

Mechanical fuel reduction when performed with motorized equipment can generate air pollutants, including carbon monoxide (CO), particulate matter, nitrous oxides (NOx), and volatile organic compounds (VOC). Equipment may run on gasoline or diesel and include chain saws, weed eaters, chippers, and tractor-mowers.

Mechanical fuel reduction projects on NPS lands with shrub dominated vegetation are generally done with hand tools, chain saws, and weed-eaters on small localized areas at the urban interface. Level grassland areas adjacent to roads and residences are mowed or disked with tractor-pulled equipment. A total of 90 acres/year is treated by mechanical fuel reduction on NPS parklands. This area will continue to be maintained under all alternatives. The park units and acreage to be treated are identified in Figure 2-1 and Table 2-4.

Ecological Prescribed Fire

Prescribed fire produces emissions depending on the fuel type and the amount of area burned. Ecological prescribed fire is proposed only in grassland and oak savanna vegetation types with relatively low fuel loadings and emission production. A maximum of 275 acres/project with a maximum of 4 projects/year is proposed.

Strategic Fuel Reduction

Strategic fuel reduction generates emissions through either prescribed burning or mechanical fuel reduction as described above. A maximum of 2 projects/year with 150 acres/project is proposed. Because specific strategic fuel reduction sites have not been identified, each project will require individual environmental review.

Education and Community Support

Education and community support have no direct effect on air quality.

Summary by Alternatives

Impacts Common to All Alternatives

Emissions that occur during wildfires would occur under all alternatives as wildfires will continue to be only partly controlled even with a policy of complete wildfire suppression. Wildfire suppression has beneficial effects in that it reduces pollutant concentrations by limiting fire size; it is a short-term physical effect that occurs at the time of individual fires; the impact on air quality is considered negligible because there is no change in the existing fire management program.

Emissions from mechanical fuel reduction are also common to all alternatives. Mechanical fuel reduction has adverse impacts in that it increases pollutant emissions; it is a short-term impact that occurs during fuel modification activities; the impact on air quality is considered to be negligible because it is an ongoing activity, with no increase in area over the existing program.

Any indirect benefits from reduced fire spread through education and community support would accrue equally to all alternatives. To the extent that community education can limit structure loss or the spread of fire through communities, education would have a beneficial, minor, short-term effect on air quality.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential air quality impacts among all alternatives. Emissions are five times greater than those from strategic fuels reduction (Alternative 2) and 5 to 31 times those from ecological prescribed burning (Alternatives 2, 3), depending on the vegetation type. Impacts on air quality from landscape mosaic burning are adverse, short-term and negligible if carried out in compliance with local air quality control board standards.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

Alternative 2 has the second greatest potential air quality impacts due to the addition of the strategic fuels reduction option, when compared to Alternatives 3 and 4. However, relative to the potential air quality emissions of the no action alternative, emissions from strategic fuels reduction are significantly lower (15-93 lbs/year vs. 75-465 lbs/year) and are therefore considered to have a negligible impact on air quality. Considered over the long-term, strategic fuel reduction would have a net beneficial impact on air quality if it could be demonstrated that fuel modification of a localized area would allow strategic control of fires to limit the wildfire size and protect structures from fire loss.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire has adverse impacts in that it increases pollutant emissions; it is a short-term impact that occurs during or shortly after burns; the overall impact on air quality is considered negligible in that there is a significant reduction in emissions compared to the No-Action Alternative (Alternative 1) — 15 lbs/year vs. 75-465 lbs/year.

Alternative 4 - Mechanical Fuel Reduction

The impact on air quality from mechanical fuel modification actions are considered to be negligible because it is an ongoing activity, with no increase in emissions over the No-Action Alternative (Alternative 1).

Conclusions

Alternative 4 minimizes air quality impacts, although impacts from Alternatives 2, 3, and 4 are negligible compared to the No-Action Alternative (Alternative 1).

Mitigation Measures

Prescribed Burning

- 1) Burn days will be selected for their ability to transport smoke to upper elevations and lessen the impacts to the local populations.
- 2) Identification of smoke-sensitive areas. All high density populous communities should be considered smoke sensitive areas. Burns will be planned to carry smoke away from smoke-sensitive areas. Maps of smoke-sensitive areas relative to the burn unit will be included in the burn plan (paper version). The map will indicate all possible directions that smoke may impact communities.
- 3) If hazardous or unhealthful smoke conditions occur and become difficult to control under prescribed burn status, the fire can be declared a wildfire in order to cease ignition and suppress it with a full brush response available from Los Angeles and Ventura County Fire Departments. Unhealthful conditions are defined as chronic smoke that exceeds federal ambient air standards (PM-10 exceeding 150 /mg for 24 hours) in a smoke-sensitive area. Further ignition is precluded and immediately reverses the smoke production trend.
- 4) If hazardous or unhealthful smoke conditions are observed (visibility less than three miles) in smoke-sensitive areas, the Fire Management Officer (FIO) will advise the Chief Ranger and the Public Information Officer. The FIO will coordinate notification about the smoke conditions and provide information about potential health impacts, after consultation with the Burn Boss and FIO. The Superintendent has the option to close the park area impacted or have the local rangers advise visitors to leave areas impacted by unhealthful smoke, the FIO would advise the media and answer phone calls.

IV Impact Topics

B Cultural/Historic Resources

Threshold Criteria

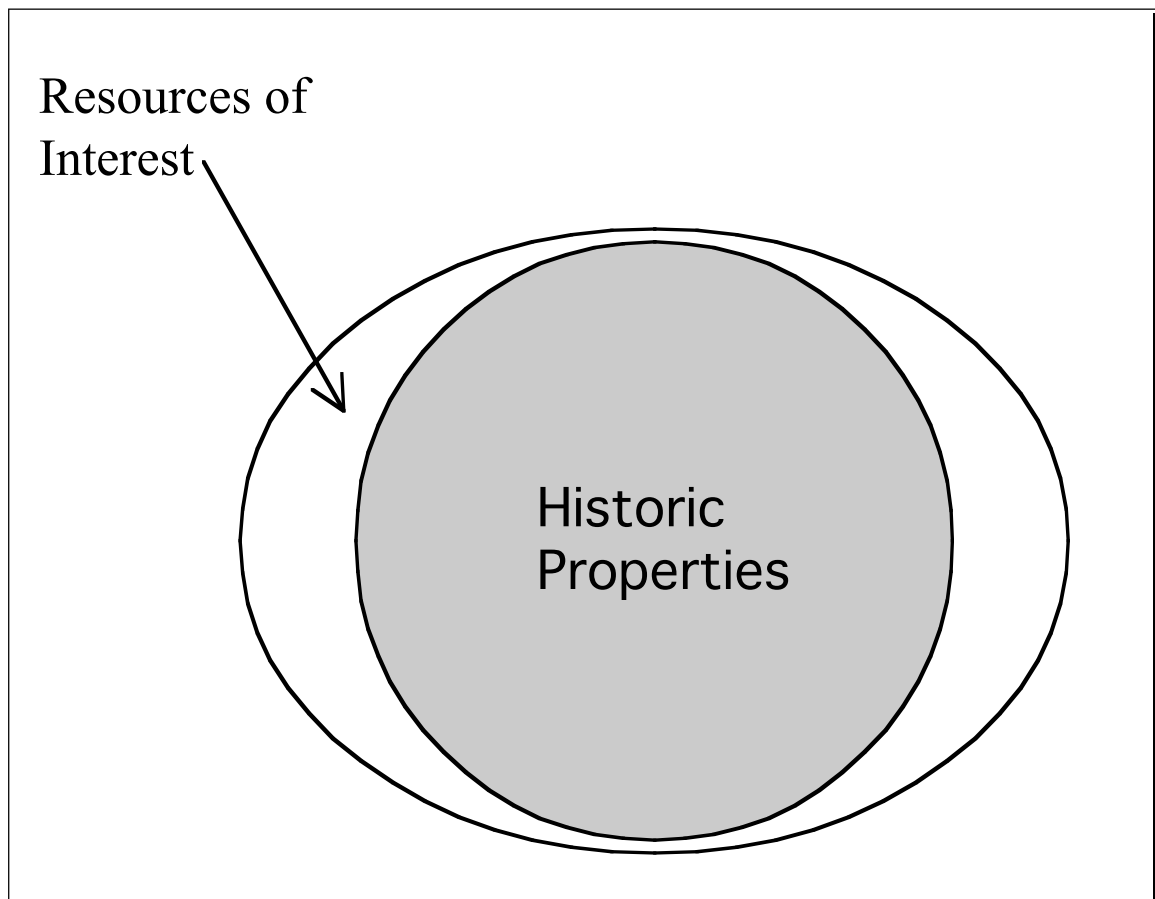
Fire management actions such as prescribed fire, suppression, and mechanical treatments have the potential to impact cultural resources such as archeological sites, structures, ethnographic resources,

and cultural landscapes. Museum objects can also be threatened by such actions, both the physical well-being of the objects themselves, and the ability to properly catalog and process those objects. Section 106 of the National Historic Preservation Act requires Federal agencies to consider the effects of its actions on properties listed in, or eligible for inclusion in, the National Register of Historic Places (i.e., Historic Properties), and allow the Advisory Council on Historic Preservation a reasonable opportunity to comment. Proper management of museum objects is dictated by 36 CFR 79.

Presently the agencies comprising the Department of the Interior, including NPS, and U.S. Department of Agriculture are developing a nationwide Programmatic Agreement with each state's respective Historic Preservation Office, the National Council of State Historic Preservation Offices, and Advisory Council on Historic Preservation. This document will follow procedures outlined in 36 CFR 800.14(b) of Section 106 of the National Historic Preservation Act. Among the core elements of the Programmatic Agreement include professional qualifications, standard protocols for cultural resources compliance for fire management actions, Indian Tribe and public participation, agency review procedures, and inadvertent effects. The benefit of Programmatic Agreement will be greatly expedited Section 106 compliance review for fire management actions, as well as the establishment of standard protocols for most effectively identifying, evaluating and protecting cultural resources during planned and unplanned fire management actions.

Terms found in Section 106 of the National Historic Preservation Act are used to describe cultural resource significance and effects in this section. However, it is important to distinguish Historic Properties (as defined above) from resources of interest, which are those classes of resources that have some potential to be important, and have the potential to be impaired by the fire management action. While Historic Properties are de facto resources of interest, these might also include sites, features, structures or other phenomenon that do not meet National Register of Historic Places criteria of significance, the minimum age requirement, and/or possesses sufficient integrity, but contribute somehow to our understanding of prehistory, history, or traditional lifeways, and could be compromised (Fig. 4-1). Each resource of interest is comprised of a set of attributes, called significant characteristics, which lend importance to that resource. An example of a resource of interest at SMMNRA are small, sparse flaked stone lithic scatters. Such resources typically have low data potential and diminished integrity due to historic land-use practices, and would generally not qualify as Historic Properties. However, when one considers that many of the Native American archeological resources found in the Santa Monica Mountains region have been heavily impacted by urban development and other disturbances, small, sparse flaked stone lithic scatters command greater importance as sources of information for understanding Native American lifeways in the area. As such, these sites deserve consideration when threatened by impacts from fire management actions.

Figure 4-1 Relationship Between Historic Properties and Resources of Interest



Impacts

The NEPA recognizes three types of impacts—direct, indirect, and cumulative. Direct impacts are those that are caused at the same time and place as the action, indirect impacts occur later in time and at a distance, while cumulative impacts are additive. In regard to cultural resources, direct, operational and indirect effect categories are utilized. Direct effects are those where the fire itself is the cause of the impacts, operational effects occur as a result of associated operations like line construction or staging, while indirect effects are ones where fire and/or associated operations result in changes to local context such that cultural resources will be effected (e.g., increased surface runoff and erosion, increased tree mortality). As such, direct and operational effects for cultural resources are the equivalent of direct impacts under NEPA, while indirect effects on cultural resources correspond to indirect and cumulative impacts.

One major impediment to cultural resources compliance related to fire management actions is a poor understanding of the nature of direct, operational and indirect effects. In an effort to remedy this situation, Federal agencies sponsored the preparation of a volume on fire effects on cultural resources to be published through the U.S. Forest Service “Rainbow Series” on fire effects. This document has yet to appear, so a review of existing fire effects knowledge was prepared

and is presented in Appendix B. The appendix broadly summarizes known direct fire effects on those components that comprise the cultural resources of SMMNRA (e.g., stone, bone, glass, metal, wood, vegetation), and operational and indirect effects that could potentially occur as a result of the proposed fire management actions.

The NEPA also dictates that potential impacts be considered in regard to type (adverse, beneficial) duration (short term, long term, permanent) and intensity. The Section 106 process considers only the adverse effects upon cultural resources, not potentially beneficial ones. An ordinal scale of impact intensity (negligible, minor, moderate, major) is also foreign to the Section 106 process — effects are either adverse (when the integrity of the historic property is diminished due to the undertaking) or they are not. Duration is not typically factored when assessing effects during the Section 106 process. These issues are considered in greater detail below in relation to direct, operational and indirect effects.

The following measures are employed to assess impacts of fire management actions on cultural resources. Further rationale for each measure is provided in discussions of direct, operational, and indirect effects that follow.

Type of Impact

- Adverse: Changes to the significant characteristics of a resource of interest. These changes may be perceptible and measurable, or, in the case of certain archeological and ethnographic resources, imperceptible and psychological.
- Beneficial: Changes on, or in the vicinity of, a resource of interest such that the significant characteristics of the resource are protected against adverse impacts of fire management actions and/or restored to some desired condition.

Duration of Impact

Archeological Resources

- Short Term-Adverse: Changes that result in permanent or temporary loss of data potential in the significant characteristics of a resource of interest, but do not manifest for a period of 10 or fewer years following the fire management action.
- Short Term-Beneficial: Changes that afford protection to the significant characteristics of a resource of interest from fire management actions for a period of no more than 10 years.
- Long Term-Adverse: Changes that result in a permanent or temporary loss of data potential in the significant characteristics of a resource of interest, and manifest in more than 10 years following the fire management action.
- Long Term-Beneficial: Changes that afford protection to the significant characteristics of a resource of interest from fire management actions for a period of no more than 10 to 20 years.

Permanent-Adverse: Changes that result in permanent loss of data potential in the significant characteristics of a resource of interest, and manifest immediately following the fire management action.

Permanent-Beneficial: Changes that result in permanent protection to the significant characteristics of a resource of interest from fire management actions.

Structures

Short Term-Adverse: Changes that result in a permanent or temporary loss of data potential in a resource of interest, but do not manifest for a period of 10 or fewer years following the fire management action.

Short Term-Beneficial: Changes that afford protection to the significant characteristics of a resource of interest from fire management actions for a period of no more than 10 years.

Long Term-Adverse: Changes that result in a permanent or temporary loss of data potential in a resource of interest, and are manifest in more than 10 years following the fire management action.

Long Term-Beneficial: Changes that afford protection to the significant characteristics of a resource of interest from fire management actions for a period of no more than 10 to 20 years.

Permanent-Adverse: Changes that result in permanent loss of data potential in a resource of interest, and that are manifest immediately following the fire management action.

Permanent-Beneficial: Changes that result in permanent protection to the significant characteristics of a resource of interest from fire management actions.

Ethnographic Resources

Short Term-Adverse: Temporary changes in the significant characteristics of a resource of interest that do not disrupt the cultural traditions associated with that resource for a noticeable period. This period would vary by resource type and traditional practitioners.

Short Term-Beneficial: Temporary changes in the significant characteristics of a resource of interest that enhance or maintain cultural traditions for a period of no more than one year. For example, burning leaf litter in an oak grove to facilitate acorn collection.

Long Term-Adverse: Temporary changes in the significant characteristics of a resource of interest for a noticeable period. This period would vary by resource type and traditional practitioners.

Long Term-Beneficial: Temporary changes in the significant characteristics of a resource of interest that enhance or maintain cultural traditions for a period of one to 10 years. For example, clearing fuel from a spiritual site to prevent intense fire behavior.

Permanent-Adverse: Permanent changes in the significant characteristics of a resource of interest that result in a loss of cultural traditions associated with that resource.

Permanent-Beneficial: Permanent changes in the significant characteristics of a resource of interest that have the potential to enhance or maintain cultural traditions in perpetuity.

Cultural Landscapes

Short Term-Adverse: Temporary alteration of the significant characteristics of a resource of interest for a period lasting no more than 10 years. Short term alterations will almost always involve living vegetation.

Short Term-Beneficial: Temporary protection, restoration, or maintenance of the significant characteristics of a resource of interest for a period lasting no more than 10 years.

Long Term-Adverse: Temporary alteration of the significant characteristics of a resource of interest for a period lasting more than 10 years. Short term alterations will almost always involve living vegetation.

Long Term-Beneficial: Temporary protection, restoration, or maintenance of the significant characteristics of a resource of interest for a period lasting more than 10 years.

Permanent-Adverse: Permanent alteration of the significant characteristics of a resource of interest. Permanent alterations will often encompass both living vegetation and other landscape features.

Permanent-Beneficial: Permanent protection, restoration, or maintenance of the significant characteristics of a resource of interest.

Museum Objects

Permanent: Permanent loss or alteration of museum objects.

Intensity of Impact

In this analysis, intensity of impact is measured relative only to adverse resource impacts.

Archeological Resources

Negligible: No or barely perceptible and changes to the significant characteristics of a resource of interest.

Minor: Perceptible and measurable changes to the significant characteristics of a resource of interest, but those changes do not inhibit interpretive potential and/or a minor percentage of the significant characteristics will be affected. Resources prone to impacts in this category might include archeological resources containing a high percentage of resources of interest with low vulnerability to the effects of fire management actions and/or possessing subsurface components.

Moderate: Perceptible and measurable changes to the significant characteristics of a resource of interest, but those changes do not inhibit interpretive potential and/or a moderate percentage of the significant characteristics will be affected. Resources prone to impacts in this category might include archeological sites containing a moderate percentage of resources of interest with low vulnerability to the effects of fire management actions and/or possessing subsurface components.

Major: Perceptible changes to the significant characteristics of a resource of interest, and those changes inhibit interpretive potential of a major percentage of the significant characteristics. Resources prone to impacts in this category might include archeological sites containing a large percentage of resources of interest with high vulnerability to the effects of fire management actions.

Structures

Negligible: Barely perceptible and not measurable changes confined to a single resource of interest or contributing element of a larger National Register district. Changes do not adversely affect significant characteristics.

Minor: Perceptible and measurable changes to a single resource of interest or contributing element of a larger National Register district. Changes do not adversely affect significant characteristics.

Moderate: Perceptible and measurable changes in the significant characteristics of a single resource of interest or small group of contributing elements in a larger National Register district.

Major: Perceptible and measurable changes of substantial magnitude in significant characteristics of a single resource of interest or large group of contributing elements in a National Register district.

Ethnographic Resources

Negligible: Barely perceptible and not measurable changes to a resource of interest.

Minor: Perceptible and measurable changes to a resource of interest. For example, an important oak grove burns during a wildfire, but not at a time or intensity that impairs acorn production or collection.

Moderate: Perceptible and measurable changes in the significant characteristics of a resource of interest. For example, an important oak grove burns during the fall, consuming a high percentage of acorns and killing a couple of productive trees.

Major: Perceptible and measurable changes of substantial magnitude in significant characteristics of a resource of interest. For example, an important oak grove burns during a severe wildfire, killing the vast majority of productive trees.

Cultural Landscapes

Negligible: Barely perceptible and not measurable changes to a resource of interest.

Minor: Perceptible and measurable minor changes to a resource of interest. For example, a severe wildfire kills a highly visible concentration of non-contributing oak trees located on the boundary of a rural historic cultural landscape.

Moderate: Perceptible and measurable moderate changes in the significant characteristics of a resource of interest. For example, a fire crew cuts down several contributing fruit trees in a rural historic cultural landscape in preparation for a prescribed burn.

Major: Perceptible and measurable changes of substantial magnitude in significant characteristics of a resource of interest. For example, extreme fire behavior and aggressive suppression action destroys a large number of contributing elements within a rural historic cultural landscape.

Museum Objects

Not applicable.

Proposed Actions

Wildfire Suppression

Direct Effects

Due to often extreme fire behavior, the direct effects of wildfires on cultural resources can be substantial, including adverse, permanent damage. Wildfires range from extremely small (<0.1 acre) to thousands of acres, and those that grow to substantial size are often driven by a combination extreme weather conditions and heavy fuels. Extremely high fire temperatures can be expected, with the implication that even the most durable cultural resources are vulnerable to major, permanent damage. Large fires will often encompass a high number of cultural resources.

As they are unplanned events, cultural resource specialists rarely have the luxury of benefits conveyed by pre-planning efforts during wildfires. For example, because a relatively small percentage of SMMNRA has been inventoried for cultural resources, it is highly likely that wildfires will occur in areas that lack or have few recorded cultural resources. Information regarding direct effects would in most cases be obtained during the post-burn phase, and involve evaluating those effects on resources for which no pre-burn condition data were available. At present, the principle post-wildfire funding source, Burned Area Emergency Rehabilitation (BAER), prohibits the use of those funds to perform post-burn inventory beyond areas impacted by suppression actions. The need for substantial post-wildfire inventory can impact the ability to complete compliance for planned fire management and other projects.

Operational Effects

Operational effects associated with wildfire suppression can often be extreme. The act of constructing fire lines, helispots, staging areas, mopping-up and other ground disturbing processes can have tremendous impacts on cultural resources. Even with Minimum Impact Suppression Techniques (MIST), the placement of fire lines and related phenomenon can be quite unsystematic when compared to planned fire management actions. Use of heavy equipment, which is extremely likely to occur at SMMNRA during suppression actions, can result in even greater impacts.

Large numbers of personnel, from varied backgrounds, are present at any substantial fire. Crews are often spread across a vast area, and their activities difficult to monitor by one or very few resource advisors. Cultural resource looting and vandalism can potentially occur during wildfire.

Indirect Effects

Due to high intensity fire and extensive disturbances related to suppression, indirect effects related to wildfires could be adverse. For example, impacts from erosion are typically pronounced in situations where most or all of the fuel has burned, and when soil permeability is reduced. Non-native tree mortality can be very high following wildfires, and the potential for tree-fall and ground disturbance around historic structures can create potential long-term cultural resource management problems. With improved ground visibility, cultural resources may be at greater

risk from looting. As noted above, these problems become even more acute when one considers that sources of funding for post-burn inventory are not readily available.

Mechanical Fuel Reduction

Direct Effects

Although fire itself is not technically a component of mechanical treatments, wildfires started by machinery might lead to severe fire behavior and major, permanent adverse resource impacts. Likewise, disposal of cut vegetation on or in close proximity to cultural resources could also result in major, permanent adverse resource impacts at some later date.

Operational Effects

Operational effects present the greatest concern in regard to the potential impacts of mechanical treatment. Ground disturbance could result in substantial impacts to cultural resources. However, mechanical treatments offer the benefit of pre-planning in that the location(s) of ground disturbance can be specifically delineated, and known cultural resources avoided. In the event that an area cannot be subjected to adequate pre-burn survey due to thick vegetation, a cultural specialist could monitor the mechanical treatment for cultural resources that become exposed. Likewise, less intensive mechanical treatments can be employed in highly sensitive areas. While looting by fuels crews is also a concern, these effects could be minimized through a combination of education and avoiding known resources.

Indirect Effects

A variety of indirect effects could arise as a result of mechanical treatments. The use of heavy equipment could result in soil compaction, and potential soil erosion on and near cultural resources. The act of thinning vegetation on or near cultural resources might leave them vulnerable to looting. Again, however, the ability to perform pre-treatment survey means that equipment can be excluded from or near cultural resources and vegetation can be strategically left in place to discourage looting. Mechanical treatments also offer the potential benefit of reducing fuel loads in proximity to cultural resources and restoring and/or maintaining historical scenes associated with structures and cultural landscapes, especially in situations where it is not desirable or possible to accomplish these tasks with the direct application of fire.

Ecological Prescribed Fire

Direct Effects

Prescribed burns offer the cultural resource specialist the opportunity to attempt to locate, evaluate and mitigate cultural resources prior to the undertaking. In cases where excessive fuel loads, topography or other restrictions place constraints on the amount and/or adequacy of pre-burn survey, it is highly likely that adverse direct impacts could occur. The ability to conduct pre-burn inventories allows the cultural resources specialist to quantitatively and spatially document fuel conditions and other variables that can be used to direct post-burn survey and more meaningfully assess damage to cultural resources that could not be documented and/or mitigated prior to the burn. While prescribed burns as large as 275 acres can be implemented, wildfires have the potential to grow much larger and encompass many more cultural resources.

Prescribed burns are implemented under specific conditions with the intent of achieving specific objectives such as ecosystem restoration, resource protection, and hazard fuel reduction. As such, it is possible, through varied timing or operational procedures (e.g., heading or backing fire) to achieve lower or higher fire intensities to accomplish those objectives. In the context of cultural resources management, a low intensity fire might be utilized on or immediately adjacent to a particular cultural resource, while a high intensity fire could significantly reduce hazardous fuels surrounding the resource. Prescribed burns are implemented at times when the likelihood of escape is low, thereby minimizing potential effects to those cultural resources in close proximity to a burn unit.

Because prescribed burns are implemented under controlled conditions, the cultural resource specialist will often have the opportunity to monitor fire behavior and the effectiveness of mitigation measures during the burn.

Operational Effects

Most operational activities, such as line construction, associated with prescribed burns are conducted in advance of the actual burn. This affords the cultural resources specialist the opportunity to survey those locations prior to any disturbances, and make necessary adjustments in order to avoid or minimize operational effects. The cultural resource specialist can also brief fire personnel on the proper protocol in and around cultural resources.

Because prescribed fires are unlikely to escape the boundaries of the burn units there is little chance of suppression-related operational effects. In the event of an escape, however, the presence of a cultural resource specialist, along with pre-burn contingency planning, will allow for a greater chance to mitigate or minimize potential adverse operational effects. Ground disturbances associated with mop-up and rehabilitation are usually few or none following prescribed burns. As discussed below, this contrasts sharply with suppression during wildfires.

Indirect Effects

The benefit of pre-burning planning allows the cultural resources specialist to account for potential indirect effects. For example, if high tree mortality is a concern following the burn, efforts can be taken to reduce the number of trees in proximity to a cultural resource. Some indirect effects like erosion are exacerbated by intense fire behavior, the type that is unlikely to occur over large areas during prescribed burns.

Strategic Fuel Reduction

Same as Ecological Prescribed Fire.

Education and Community Support

Impacts associated with education and community support will largely be beneficial, although highly dependent on the nature of the fire management action. Pre-planned events such as prescribed fires and mechanical treatment provide the opportunity to demonstrate the effectiveness of cultural resources compliance to local Native American communities and the interested public.

During unplanned events, such as wildfires, time for effective communication is often more limited and can be more controversial since resources are often damaged.

Summary by Alternatives

Impacts Common to All Alternatives

The amount of mechanical thinning to be performed in WUI areas and cultural resources is the same in all alternatives. Direct effects resulting from mechanical thinning would not be common, but are likely to be adverse. Operational effects could be avoided or minimized through adequate pre-planning and monitoring. Potential indirect effects can be mitigated by the ability to perform pre-treatment survey, and to avoid ground disturbance directly on or in close proximity to cultural resources, ensure proper debris disposal, etc. The act of performing annual mechanical thinning on and adjacent to cultural resources will be a beneficial impact with regard to the success of long term preservation.

Alternative 1

This alternative includes mechanical thinning, 1000-1500 ac. of strategic prescribed fire, and wildfire suppression. Strategic prescribed fire provides the ability to perform pre-treatment surveys and mitigation measures, thereby minimizing direct, operational and indirect effects. The rate of proposed treatment with strategic prescribed fire is rapid enough to ensure that resources can be treated before experiencing the effects of a wildfire, but perhaps too ambitious with regard to completing necessary cultural resource compliance given staffing at SMMNRA.

Alternative 2

Actions associated with Alternative 2 include mechanical thinning, 0-1400 ac. of ecological prescribed burning, 150 ac. of strategic prescribed burning, and wildfire suppression. Beneficial impacts of this alternative include the ability to pre-plan for prescribed burns and mechanical treatments. On the other hand, heavy reliance on prescribed burning means that those cultural resources vulnerable to direct fire effects could be adversely impacted in situations where adequate pre-burn survey and/or mitigation could not be employed. The rate of treatment in Alternative 2 is more modest than that for Alternative 1, and perhaps more realistic in terms of the ability to complete cultural resource compliance.

Alternative 3

Actions associated with Alternative 3 are the same as Alternative 2, minus the 150 ac. of strategic prescribed burning. Impacts would be similar to those reported for Alternative 2.

Alternative 4

Actions associated with Alternative 4 include mechanical thinning and wildfire suppression. Mechanical treatments allow for pre-planning, but the rate of treatment is too slow to sufficiently minimize the impacts of future wildfires.

Conclusions

Alternative 2 is the environmentally superior alternative because strategic fuel modification projects will, by definition, modify wildfire behavior, while any potential adverse impacts from implementation actions would be identified and mitigated in the EA required for such projects. Alternative 1 has the greatest potential to adversely impact cultural resources because of the scope of the prescribed burning program, the limited ability to perform pre-planning and survey work, and the limited effectiveness of mosaic prescribed fire to protect cultural resources from wildfire impacts. Alternatives 3 and 4 are neutral with respect to cultural resources, with no major protection benefits or adverse impacts.

Mitigation Measures

The NEPA dictates that all mitigation measures in response to proposed actions be identified, their effectiveness measured, and impacts assessed if the proposed actions were to proceed without mitigation. This analysis differs from Section 106 in that it does not suggest that the level of effect is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effects remain adverse.

Standardized, detailed mitigation measures for fire management actions at SMMNRA will be presented in the Cultural Resource Component (CRC) of the *Fire Management Plan*. The contents of the CRC are dictated by the forthcoming programmatic agreement for fire management actions discussed on page ##. The programmatic agreement will be accompanied by a companion set of guidelines, in which appropriate mitigation measures are identified for the various types of fire management actions. Each respective Historic Preservation Office, the National Council of State Historic Preservation Offices, and Advisory Council on Historic Preservation will ratify these mitigation measures as acceptable, when used appropriately, for mitigating the effects of fire management actions on cultural resources.

Following mandates presented in *Director's Order* 18, RM 18 and NEPA, the NPS fire monitoring program was developed to accomplish a suite of objectives ranging from the acquisition of basic information to providing direction for fire and resource management programs. The recently completed Fire Monitoring Handbook (USDI, National Park Service, 2000) provides standardized methods for monitoring and managing wildland and prescribed fire.

Wildfire Suppression and Ecological Prescribed Fire

Mitigation of impacts to cultural resources against the effects of fire management actions involves a combination of knowledge of the potential direct, operational and indirect effects of known or suspected resources, appropriate resource inventory methods, and protection and treatment measures. Appropriate mitigation measures can be conveniently divided into pre-action, during-action, and post-action categories. Those that will be employed at SMMNRA include:

Pre-Action

- 1) The following measures should be taken in advance of prescribed burning and in anticipation of wildfire
 - Cultural resources will be considered during all fire management planning efforts.
 - Fire management personnel and other staff will receive annual training on cultural resources and fire management actions.
 - All cultural resources will be evaluated with respect to hazardous fuel loads. As needed, fuel loads will be reduced using methods commensurate with avoiding or minimizing adverse effects. Maintaining light fuel loads on and in close proximity to cultural resources will be emphasized.
 - All areas slated for ground disturbing activities will be subjected to pre-action field surveys. This includes areas likely to be disturbed during future wildfires.
 - Pre-burn survey will be conducted prior to all prescribed burns as dictated by resource distribution and vulnerability, vegetation and topography, and expected fire behavior.
 - Consultation with local Native American communities will continue to occur in the context of fire management actions. Spiritual sites and important plant communities will be identified and appropriately managed for preservation, maintenance, and/or enhancement.
 - Computer and other databases containing cultural resources data will be created and maintained, and made available to fire management personnel in the event of emergencies.
 - Cultural resources specialists from adjacent land management agencies will be consulted in order to coordinate mitigation efforts prior to planned and unplanned fire management actions.
 - Appropriate cultural resources monitoring protocols will be established and implemented.
 - Potential research opportunities to study the effects of fire management actions on cultural resources will be identified.

During-Action

- 1) Appropriate and responsible protection of archaeological resources on NPS property requires the identification and avoidance of prehistoric archaeological sites and sensitive areas. However, due to their vulnerability to vandalism and looting, the location of archaeological sites is confidential by state governmental policy. Access to this information is restricted to few individuals. This situation creates an inherent conflict with the need to identify and avoid such sites during fire suppression efforts. An effective fire management plan must include provision for providing cultural resource expertise and consultation to the Incident Command System. At minimum, this should include a qualified archaeologist in conjunction with the relevant geographic information necessary to identify archaeological sites in the Santa Monica Mountains.

- A cultural resource specialist or resource advisor will be present during all fire management actions where recorded and unrecorded resources of interest are considered at risk. Additional survey will be conducted on an as-needed basis.
- Observations of fire behavior and other variables will be made with respect to recorded cultural resources and/or areas with high probability of containing unrecorded cultural resources.
- Cultural resources data will be shared with fire management personnel as needed to avoid or minimize adverse effects.
- A cultural resource specialist or resource advisor will educate fire management personnel about cultural resources and the potential impacts of fire management actions.

Post-Action

1) Because vast regions of the Santa Monica Mountains have never been surveyed for cultural resources, it is certain that not all of the archaeological sites in the Santa Monica Mountains have been previously identified and recorded. Realizing this, it is important that an effective fire management plan also provide for post-fire surveys. Shortly following a fire is one of the best times to conduct a pedestrian survey because ground visibility is generally very good after the vegetation has burned off. A post-fire surveying program will help to identify additional cultural resources and archaeological sites within NPS owned properties. Combined, the actions outlined above will further the NPS's mandate to preserve, protect, and manage cultural resources in the Santa Monica Mountains.

- The post-action condition of all recorded cultural resources will be assessed. Resources requiring stabilization or other treatment will be mitigated.
- As appropriate, post-action survey will be conducted in previously surveyed and unsurveyed areas. Previously unrecorded cultural resources will be assessed for condition, and stabilization and other protection needs.
- Monitoring and research data will be compiled, evaluated, and used to help refine cultural resource compliance for fire management actions.

Fuel Modification

1) Existing fuel modification sites need to be surveyed for archaeological resources.

IV Impact Topics

CI Land Use

Fire management activities and wildfires were evaluated for their potential to affect land use patterns and urbanization impacts.

Threshold Criteria

Type of Impact

- Adverse: Increases the amount of development and/or associated urbanization impacts on natural/wildland areas.
- Beneficial: Decreases the amount of development and/or associated urbanization impacts on natural/wildland areas.

Duration of Impact

- Short-term: Transitory (less than three years), occurring primarily during or just after fire management activities (prescribed fire, biomass removal, etc.)
- Long-term: Permanent change in land use.

Intensity of Impact

- Negligible: No measurable effect.
- Minor: Effects limited to existing urbanized areas.
- Moderate: Geographically localized effect, does not affect significant natural resource areas
- Major: Effects occur on a landscape level and impact natural/wildland areas.

Proposed Actions

Wildfire Suppression

During major wildfire events, massive wildfire suppression efforts are required to protect lives and property in the Santa Monica Mountains as a result of the complex intermixing of highly flammable vegetation and development. Increased development in the wildland urban interface has been repeatedly identified as the cause of the escalating public costs of wildland fire suppression. It has been argued that providing public dollars to protect private property in extreme wildfire environment has allowed development and urbanization of the Santa Monica Mountains (Davis, 1999). Wildfire suppression is essential given the existing pattern of development, but in the abstract should be considered to have an adverse impact on land use in the Santa Monica Mountains.

Mechanical Fuel Reduction

New development sited too close to park boundaries has the potential to adversely impact park resources if vegetation needs to be cleared to protect private structures. Conversely, if structures are located too close to flammable park vegetation, the potential for structure loss exists. The park is currently providing mechanical fuel reduction on park properties where the required defensible space of pre-existing development extends onto park property.

Because fuel modification destroys the habitat values which the park was established to protect,

the NPS proposes to follow the guidelines established in the California Department of Parks and Recreation's policy on fuel modification (Appendix A). This policy statement places the primary responsibility for structure protection on the homeowner through the use of appropriate building materials, building design, and landscaping. The park will agree to remove vegetation only after the homeowner has taken all feasible steps to protect their property and it has been established by scientific analysis that the park vegetation poses a hazard to the safety of the structure.

If local agencies continue to permit new development only in locations where fuel modification is not required on park property, then fuel modification will be neutral with respect to land use impacts.

Ecological Prescribed Fire

Ecological prescribed fire has no impacts on land use.

Strategic Fuel Reduction

If the expanding footprint and increased density of development creates pressure to control large wildfires using strategic fuels reduction on park properties, then this is considered to be an adverse land use impact.

Education and Community Support

Education and co-operation with the local governments that grant development permits is essential. Education needs to emphasize that there are unavoidable environmental impacts that occur with development in the Santa Monica Mountains in order to provide a fire safe environment for homes. The impacts to habitat, wildlife, soil, geology, and watershed values can not be avoided, but can be minimized with appropriate zoning, structure siting, design, construction materials and landscaping.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has a major, adverse long-term impact on land use by promoting development in a recurring wildfire environment.

Fuel modification impacts are neutral with respect to land use if new development is located so that no fuel modification is required on park property.

Education and community outreach benefits are identical among all alternatives including the No-Action Alternative (Alternative 1).

Alternative 1 – No-Action Alternative

The landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has no impact on land use.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

If the expanding footprint and increased density of development in the Santa Monica Mountains creates pressure to control large wildfires using strategic fuels reduction on park properties, then this would be a major, adverse, long-term impact.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire has no impacts on land use.

Alternative 4 – Mechanical Fuel Reduction

Impacts to land use from mechanical fuel reduction are considered to be negligible because it is an ongoing activity with no increase in the amount of affected area over the no-action alternative. Impacts are identical among all alternatives

Conclusions

Alternative 1, 3, and 4 are equivalent in their lack of adverse impacts to land use, but no alternative provides benefits that makes one the superior alternative in this issue area.

Mitigation Measures

Fuel Modification

- 1) NPS should continue to consult with Los Angeles and Ventura County Fire Prevention and Planning Departments on structure siting adjacent to park property to ensure that fire safety for new development can be ensured without vegetation clearance on park properties.
- 2) In order to minimize the fuel modification zone, the NPS and other agencies should work together to identify the amount of fuel modification required to protect structures from radiative heat loss or from loss due to direct flame impingement. The NPS should analyze the potential cumulative habitat impacts from fuel modification that exceeds the amount necessary to protect structures (e.g., 100' vs. 200').

Education and Community Support

- 1) NPS should work with local governments to develop appropriate zoning for structure siting, design, and construction materials in order to avoid development that creates irreconcilable conflicts between fire safety and environmental impacts.

IV Impact Topics

C2 Land Use – Recreation

Threshold Criteria

Fire management activities and the potential for closures, restrictions and direct effects were evaluated for their potential to affect visitation and an aggregate of recreational activities in the SMMNRA.

Type of Impact

Adverse: Reduce visitor participation, quality of visitor experience, and/or service level.
Beneficial: Enhance visitor participation, quality of visitor experience and/or service level.

Duration of Impact

Short-term: Temporary in nature, during the period when a fire management activity would take place.
Long-term: Permanent effect on the visitor experience.

Intensity of Impact

Negligible: Imperceptible or undetectable effect upon visitors.
Minor: Slightly detectable or localized effect on visitors; < 20% visitors notice effect at the affected area.
Moderate: Readily apparent localized effects on visitors; 90% visitors notice effect at the affected area; minor restrictions on visitor use.
Major: Substantial, highly noticeable effects and/or effects that would result in major limits on activities; effect persists beyond the period of active fire management activity.

Proposed Actions

Wildfire Suppression

During periods of major wildfires and active wildfire suppression activity, visitor use is constrained by road closures and the lack of access to areas within the wildfire zone. After a wildfire, park lands may be closed to the public (Title 36 Code of Federal Regulations Part 1, Section 1.5(a) Closures and Public Use Limits and Section 1.7(a) Public Notice.) to protect exposed cultural resources and to prevent soil disturbance from foot traffic in areas that would normally be inaccessible due to vegetation growth. Wildfire suppression itself is therefore interpreted as a temporary adverse impact on recreational uses, but is generally beneficial to the degree that it limits the amount of burned area to which access might be restricted post-fire.

Mechanical Fuel Reduction

Mechanical fuel reduction on park properties is performed in very limited areas at the urban interface and has no effect on recreational use of NPS lands.

Ecological Prescribed Fire

During ecological prescribed burn operations, the affected park land is normally closed to visitor use. Closures occur only on the actual day of the prescribed fire, but there are no subsequent limits on park use after the prescribed burn.

Fire lines cut for prescribed burns are highly visible after the fire and are often used by visitors as new trails. Fire lines after a prescribed fire therefore need to be posted and require additional ranger services to keep visitor use to established trails.

A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire. This would require a maximum of eight days of restricted visitor access at four burn sites.

Strategic Fuel Reduction

It is not possible to evaluate the recreation impacts of the strategic fuels reduction alternative without a geographically specific project proposal. A maximum of 2 projects/year with 150 acres/project is proposed, subject to environmental analysis. Because these projects are likely to be located in areas of heavy fuel load with complex topography, the number of days to carry out the projects are likely to be more than for ecological prescribed burns in grasslands. They are also likely to be located in more remote areas and have low visitor use. Finally they may require closures after treatment for some of the same reasons areas are closed after wildfires. Counterbalancing the potential direct impacts to recreational use from strategic fuels modification are the theoretical benefits of less acreage burned in wildfires and less adverse recreational impacts associated with large fires.

Education and Community Support

Recreational experiences can be enhanced with educational opportunities provided by both wildfires and ecological prescribed burn projects. Fires offer the unique opportunity to observe the often dramatic wildfire displays that occur in the first two years following wildfires and to educate the public about the fire adapted nature of the Santa Monica Mountains plant communities. Prescribed ecological fire sites also offer educational opportunities about the beneficial uses of fire and the plant restoration needs in the Santa Monica Mountains.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression has an adverse, moderate but short-term impact on recreational use. Wildfires themselves may have a

more long-term impact if large areas of parkland must be closed to visitor use to protect cultural and natural resources.

Fuel modification is common to all alternatives, but will have no impact on recreational use.

Education and community outreach are proposed under all alternatives, but opportunities to positively affect the public's recreational experiences are most obvious following wildfires and with ecological prescribed burns.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact recreational use from the number of closures required during prescribed burn days and for the potential for post-burn closures. Potential impacts to recreation from landscape mosaic burning are considered to be major, adverse, and both short-term and long-term.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to recreational use from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Both adverse and beneficial impacts are possible.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Direct impacts to recreational use from ecological prescribed fire are adverse, short-term and moderate. The educational benefits from ecological prescribed fire provide a beneficial, long-term, moderate impact, which outweigh the short term impacts of a local one-day closure.

Alternative 4 – Mechanical Fuel Reduction

Impacts to recreational use from mechanical fuel reduction are negligible.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1) and includes the benefits of Alternative 3. Alternative 2 includes strategic fuel modification as a fire management technique which has potential adverse recreational impacts, but these are counterbalanced by the potential benefits of reduced acreage burned in wildfires which will need to be evaluated with a project-specific EA.

Mitigation Measures

- 1) Fire lines should be posted and monitored to avoid creating new and undesirable trails after prescribed burns and wildfires.

- 2) Education walks should be developed on wildfire sites to view wildflower displays that occur in the first two years following wildfires and to educate the public about the fire adapted nature of the Santa Monica Mountains plant communities. Education programs/walks should be developed at prescribed ecological fire sites to show the beneficial uses of fire and the plant restoration needs in the Santa Monica Mountains.

IV Impact Topics

C3 Land Use – Scenic Resources

Scenic Resources

Fire management activities and operations, wildfires, and smoke from prescribed fires were evaluated for their potential to affect the scenic quality of major scenic values.

Type of Impact

Adverse: Degrades visual quality.

Beneficial: Improves visual quality.

Duration of Impact

Short-term: Transitory (less than one season), occurring primarily during or just after fire management activities (prescribed fire, biomass removal, etc.).

Long-term: Effects are detectable eight years after fire treatment; may be irreversible.

Intensity of Impact

Negligible: Imperceptible or undetectable.

Minor: Slightly detectable or limited to a relatively small area; not a scenic viewshed.

Moderate: Readily apparent from major roads, trails, or other viewpoints; effects short-term.

Major: Substantial, highly noticeable; within scenic viewshed; and/or results in a change of character of the landscape.

Proposed Actions

Wildfire Suppression

Wildfire suppression activities may locally affect scenic qualities of a park view, but these effects are generally submerged in the large-scale landscape effect of most wildfires. The majority of visitors and the public feel that the burned landscape following a wildfire is visually ugly and disturbing. Fires usually burn in the fall and the first major regrowth does not occur until after the winter rains. Scenic impacts from wildfires therefore persist for 5-6 months until the first wave of regrowth provides vegetative cover of the burn area. Shrublands take about 8 years to reach canopy closure.

Suppression operations may have a limited and temporary adverse impact on scenic qualities, but is overall generally beneficial to the degree that it limits the amount of burned area which is considered to be visually unpleasant.

Mechanical Fuel Reduction

Mechanical fuel reduction is visually obvious in shrublands and has a strong adverse impact on the visual quality of the mountain landscape. 90 acres of fuel modification on park properties is performed at the urban interface, usually at lower elevations, along park boundaries. The visual impact is significantly less than that which occurs on surrounding private property, especially private residences located on ridgetops and on highly visible slopes.

Ecological Prescribed Fire

The visual impact of prescribed fire is similar to that of wildland fires, but much more limited in scope. Usually only a small portion of a viewshed is impacted so that the entire landscape does not appear to be “devastated.” Ecological prescribed burns are proposed in annual grasslands, not shrublands, so that the visual impact of the fire will have disappeared after 6 months. Fire lines cut for prescribed burns are highly visible after the fire and may persist even after the vegetation has recovered.

A maximum of 275 acres/project with a maximum of 4 projects/year is proposed for ecological prescribed fire.

Strategic Fuel Reduction

It is not possible to evaluate the visual impacts of the strategic fuels reduction alternative without a geographically specific project proposal. A maximum of 2 projects/year with 150 acres/project is proposed, subject to environmental analysis.

Education and Community Support

Education may help alleviate the perception of burn areas as devastated and instead recognize them as one phase in the wildfire cycle.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression activities may have adverse, minor, short-term impacts on scenic quality. Wildfires themselves have a major, adverse, but short-term impact.

Fuel modification has adverse, moderate, long-term impacts on scenic qualities, but these impacts are pre-existing and common to all alternatives.

Education and community outreach are proposed under all alternatives.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to adversely impact scenic resources. Potential impacts to scenic resources from landscape mosaic burning are considered to be moderate, adverse, and short-term.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The impacts to scenic resources from strategic fuels reduction are unknown and will need to be evaluated with project specific environmental analysis. Both adverse and beneficial impacts are possible.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Direct impacts to scenic resources from ecological prescribed fire are adverse, short-term and moderate.

Alternative 4 – Mechanical Fuel Reduction

Fuel modification has adverse, moderate, long-term impacts on scenic qualities, but these impacts are pre-existing and common to all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it avoids the adverse impacts of the No-Action Alternative (Alternative 1) and shares in common the impacts of Alternatives 3 and 4. Alternative 2 includes strategic fuel modification as a fire management technique which has potential adverse scenic impacts, but these are counterbalanced by the potential benefits of reduced acreage burned in wildfires which will need to be evaluated with a project-specific EA.

Mitigation Measures

None.

IV Impact Topics

C4 Land Use – Health and Safety

Threshold criteria

Fire management activities and operations and wildfires were evaluated for their potential to affect public health and safety.

Type of Impact

Adverse: Increases the probability of injury, death or property loss.
Beneficial: Decreases the probability of injury, death or property loss.

Duration of Impact

Short-term: Injury does not require professional medical attention; property damage not structural or permanent.
Long-term: Injury requires professional medical attention; property damage requires structural repairs.

Intensity of Impact

Negligible: Imperceptible or undetectable.
Minor: Limited to a single residence.
Moderate: Limited to a local neighborhood.
Major: Affects entire community or communities.

Proposed Actions

Wildfire Suppression

Wildfire suppression in the fire environment of the Santa Monica Mountains is essential to public health and safety by limiting the extent of wildfires and thereby limiting potential injury, death and property loss from wildfires. Wildfire suppression places fire fighters at risk of injury or death and firefighter safety is considered to be more important than property protection.

Mechanical Fuel Reduction

Mechanical fuel reduction to create a defensible space between wildland fuels and structures provides the most effective means of preventing structure loss. Mechanical fuel reduction has numerous adverse impacts on natural resources and should be limited to that amount necessary to ensure structural protection under extreme wildfire conditions. The NPS policy on fuel modification will follow that established by the California Department of Parks and Recreation (Appendix A).

Ecological Prescribed Fire

Ecological prescribed fire in annual grasslands and oak savannah has no impact on public health and safety.

Strategic Fuel Reduction

Strategic fuels reduction would have a positive benefit on public health and safety if it could be demonstrated that there were geographic locations where it would be effective. The analytical

procedure required to evaluate the potential risk: benefit ratio of any project proposal has been outlined in the discussion of fire hazard assessment (Figure 3-17).

A maximum of 2 projects/year with 150 acres/project is proposed based on what is realistically achievable for park staff and NPS partners. Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

Education will have positive benefits in promoting public health and safety where it can be used to teach residents appropriate wildfire safety techniques. These include appropriate home maintenance and construction; fuel modification techniques; use of appropriate landscaping; avoidance of plants that increase fuel load; appropriate structure siting; and evacuation plans.

Any education or community program that reduces fire ignitions will provide a significant benefit by reducing fire frequency. Prevention measures might include closing parklands during extreme weather, no camp fires during fire season, and evaluation of road clearing projects. Efforts to effectively address prevention of fires started by arson and power lines are critical.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression provides major, beneficial, long-term impacts to public health and safety.

Fuel modification impacts are also common to all alternatives. Fuel modification has moderate, beneficial, long-term impacts to public health and safety.

Education and community outreach impacts are identical among all alternatives and are considered to have major, long-term beneficial effects.

Alternative I – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has limited potential to positively benefit public health and safety. Although several prescribed burns have been cited as critical in preventing structure loss in major wildfires (e.g., Monte Nido, Spitzer, 2001; Ventura County Fire Dept., pers. comm.; 1996 Malibu Creek prescribed burn, Frank Padilla, pers. comm.) these reports are largely anecdotal. The fuel load at the time of the fires, the treatment effect on fire behavior in comparison to fire behavior in the absence of treatment, and the return time required for re-treatment are unknown. Both the amount of treated land and the return time required to maintain vegetation in a condition that effectively alters fire behavior are believed to be infeasible and ecologically damaging at the scale proposed in the existing program. Because the program can not be realistically carried out, it does not provide any measurable benefits to public health and

safety.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

Strategic fuels reduction would have a positive benefit on public health and safety if it could be demonstrated that there were geographic locations where it would be effective. The impacts will need to be evaluated with project specific environmental analysis.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire has no significant impact on public health and safety.

Alternative 4 – Mechanical Fuel Reduction

Mechanical fuel modification has moderate beneficial long-term impacts to public health and safety. Impacts are identical among all alternatives.

Conclusions

Alternative 2 is the environmentally superior alternative because it includes the benefits of Alternative 4 (fuel modification) as well as strategic fuel modification which has potential public health and safety benefits. The No-Action Alternative (Alternative 1) and Alternative 3 are inferior relative to Alternative 2 because they include actions that are neutral with respect to public health and safety.

Mitigation Measures

Wildfire Suppression – Operational Impacts

- 1) Provide for firefighter safety as a first priority.
- 2) Work with local jurisdictions to develop appropriate zoning to limit new residential development in areas that lack safe ingress and egress due to mid-slope road location, length of access, and surrounding fuel load.

Education and Community Outreach

- 1) To prevent loss of life and injury, promote the development of evacuation plans by local agencies and adequate defensible space as a highest priority for community safety.

IV Impact Topics

C5 Land Use – Risk of Catastrophic Events

Threshold criteria

Fire management activities and operations were evaluated for their potential to limit the risk of catastrophic fires.

Type of Impact

Adverse: Increases the scope or frequency of large scale fires.
Beneficial: Decreases the scope or frequency of large scale fires.

Duration of Impact

Short-term: Reduces the scope of individual fires.
Long-term: Reduces the frequency of large scale fires.

Intensity of Impact

Negligible: Imperceptible or undetectable.
Minor: Fires 1 -100 acres.
Moderate: Fires 100-10,000 acres .
Major: Fires >10,000 acres.

Proposed Actions

Wildfire Suppression

Despite the most intensive suppression efforts, large fires are an infrequent, but re-occurring event. These fires occur under the most extreme climactic conditions and have the potential to be catastrophic in terms of their size, post-fire watershed impacts, and their potential to cause significant loss of life and property. Wildfire suppression in this environment is both essential and beneficial.

Mechanical Fuel Reduction

Mechanical fuel reduction on park properties has no impact on reducing the risk of catastrophic fire, although it reduces the probability of structure loss when catastrophic fires do occur.

Ecological Prescribed Fire

Ecological prescribed fire in annual grasslands and oak savanna has no impact on reducing the risk of catastrophic fire.

Strategic Fuel Reduction

Strategic fuels reduction would have a positive benefit on the risk of catastrophic fires if it could be demonstrated that there were geographic locations where it would be effective. The analytical procedure required to evaluate the potential risk: benefit ratio of any project proposal has been outlined in the discussion of fire hazard assessment (Figure 3-17). Because specific strategic fuel reduction sites have not been identified, each project will require an individual environmental review.

Education and Community Support

Any education or community fire prevention program that reduces fire ignitions will potentially reduce the probability of catastrophic wildfires. Catastrophic fires are most often linked to ignition by arson or power lines and any measures to effectively limit this source of ignition would reduce the frequency of catastrophic wildfires.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Wildfire suppression provides major, long-term benefits to the risk of catastrophic wildfires.

Fuel modification impacts are also common to all alternatives. Fuel modification has no impact on the risk of catastrophic wildfires.

Education and community outreach impacts are identical among all alternatives and are considered to have major, long-term beneficial effects.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has limited potential to reduce the risk of catastrophic wildfires. Large fires are driven by climactic conditions that allow fires to burn through all age classes of vegetation except possibly the very youngest. It does not provide any measurable benefits to public health and safety. The effect of the current program is considered to have a negligible impact on reducing the risk of catastrophic wildfire.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

Strategic fuels reduction would have a positive benefit on reducing the risk of catastrophic wildfire if it could be demonstrated that there were geographic locations where it would be effective in controlling fire spread. The impacts will need to be evaluated with project specific environmental analysis.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Ecological prescribed fire has no significant impact on reducing the risk of catastrophic wildfire.

Alternative 4 – Mechanical Fuel Reduction

Mechanical fuel modification has no significant impact reducing the risk of catastrophic wildfire.

Conclusions

Alternative 2 is the environmentally superior alternative because it is the only alternative which

includes a fire management technique (strategic fuel modification) that has the potential to reduce the risk of catastrophic wildfire.

Mitigation Measures

Education and Outreach

- 1) The NPS and other agencies should to continue to co-operate in all activities that promote fire prevention in order to reduce fire frequency. The NPS should continue to evaluate the cause of fires and support projects that effectively limit fire starts especially arson and power line ignitions.

IV Impact Topics

D Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations implementing NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined by CEQ as “*the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions*” (40 CFR 1508.7). Cumulative impacts are analyzed for both the no-action and action alternatives.

Proposed Actions

Wildfire Suppression

Action will be taken to suppress every fire in the SMMNRA; as a result, most fire starts will be suppressed or limited in scope, but a small percentage will escape initial attack and become major wildland fires. In large wildfire events, suppression operations are not under the control of the NPS, but rest with Los Angeles or Ventura County Fire Departments. The NPS has the ability to provide an engine crew and perform an advisory role to other agencies whose actions will have a direct impact on resources and public safety.

Impacts from wildfire suppression to vegetation, wildlife, habitat connectivity, non-native species, special status animals, soil, water resources/wetlands, and recreation/scenic are mixed: there are adverse operational impacts but the total area burned and the average fire rotation interval are reduced. Impacts to air quality, health and safety, and risk of catastrophic events are all reduced by fire suppression. Cultural resources, special status plants, paleontological resources, and land use have the potential to be adversely impacted by wildfire suppression.

The operational impacts associated with fire suppression have the potential to have a cumulative adverse impact because of the number and quality of resources that can be affected, the high fire

frequency, and the quantity of fire fighting resources that are allocated to incidents. For example, the Pacific Coast Fire (January, 2003) had 1000+ firefighters deployed on an approximately 750 acre fire. One hundred sixty-five engine strike teams (825 engines), 25 single engines, 129 hand crews, 50 water tenders, and 13 bulldozers were deployed on the 16,516 acre Old Topanga Fire (November, 1993). These massive firefighting resources may be the most serious factor contributing to cumulative operational impacts because of the lack of resource knowledge and resource protection values of field firefighting crews; lack of communication regarding resource protection between the incident command team and field crews; and lack of field oversight for resource protection. NPS needs to fully participate in the Incident Command structure of wildland fire incidents occurring within the park boundaries, in order to minimize the operational impacts that may occur to resources due to a lack of oversight and input from park management specialists.

Mechanical Fuel Reduction

Mechanical fuel reduction is performed in a very limited area by the NPS and other parks agencies including the California Department of Parks and Recreation and Mountains Recreation and Conservation Authority. Fuel reduction projects are common along roadways and are performed by County public works or County fire crews. The vast majority of mechanical fuel reduction occurs on private property around residential and other structures and is required on an annual basis by the Ventura County, Los Angeles County, and Los Angeles City Fire Departments.

Cumulative impacts from fuel modification are negligible or unknown for air quality, special status plants and animals, paleontological resources, and the risk of catastrophic wildfires.

Mechanical fuel reduction has significant adverse cumulative impacts on vegetation, wildlife, habitat connectivity, non-native species, soil, water resources/wetlands, and scenic resources. However fuel modification provides significant benefits to health and safety because it is the most effective method of structure protection at the wildland interface. The cumulative impacts can not be eliminated because of the necessity to protect lives and property. However, the effects can be reduced by limiting the fuel modification zone around homes to the minimum required to effectively protect structures; by limiting development to defensible sites (i.e., off of ridgelines and setback from steep slopes); and by limiting development to existing developed zones with safe access (i.e., no lengthy or midslope driveways).

Ecological Prescribed Fire

Carried out at the landscape level in shrubland community types, prescribed fire has the potential to adversely impact vegetation, wildlife, habitat connectivity, non-native species, soil, water resources/wetlands, air quality, special status plants and animals, cultural resources, paleontological resources, recreational, and scenic resources. At the same time it provides no predictable benefits to health and safety or to reducing the risk of catastrophic wildfires. However when prescribed fire is used for restoration or exotic species control in degraded grassland and oak savanna plant communities the impacts shift from adverse to beneficial.

The cumulative impacts of prescribed fire in the Santa Monica Mountains are unknown at this time. The scope of prescribed burn projects, the vegetation type, and the project objectives of the California Department of Parks and Recreation, and Los Angeles and Ventura County Fire Departments are unknown. These agencies seem to be reducing the amount of prescribed burning in shrublands that they have planned for the future.

Strategic Fuel Reduction

It is not possible to evaluate the cumulative impacts of strategic fuels reduction without geographically specific project proposals. The analytical procedure required to evaluate the potential risk:benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-17). Each project will require an individual environmental review and a maximum of 2 projects/year with 150 acres/project is proposed for NPS lands. If carried out on a large-scale basis, cumulative impacts could be similar to those of landscape prescribed burning and/or mechanical fuel modification.

Education and Community Support

NPS community education and support programs will combine to create cumulative benefits with existing community and agency programs to promote fire safety and environmental protection.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Cumulative impacts from wildfire suppression are indistinguishable among alternatives.

Fuel modification impacts are common to all alternatives. Cumulative impacts from wildfire suppression are indistinguishable among alternatives.

Cumulative benefits from education and community outreach are identical among all alternatives.

Alternative 1 – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the greatest potential to contribute to adverse cumulative impacts to vegetation, wildlife, habitat connectivity, non-native species, soil, water resources/wetlands, air quality, special status plants and animals, cultural resources, paleontological resources, recreational and scenic resources. The magnitude of cumulative impacts is unknown as other agencies appear to be reducing the amount of prescribed burning they will do in shrubland vegetation types and the scope of their future projects is unknown.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

The cumulative impacts from strategic fuels reduction are unknown and will depend on the impacts associated with projects outside of NPS lands.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Cumulative impacts from ecological prescribed fire are unknown as the scope and objectives of prescribed burns on land outside of NPS properties are unknown.

Alternative 4 – Mechanical Fuel Reduction

Cumulative fuel modification impacts are common to all alternatives.

Conclusions

There are no significant difference among alternatives with respect to the SMMNRA's contribution to cumulative impacts from park fire management actions.

Mitigation Measures

Although there are no significant differences among alternatives with respect to the SMMNRA's actions, significant cumulative impacts for different types of fire management actions were identified. Mechanical fuel modification and suppression operations have a significant cumulative impact on the SMMNRA's resources. Mitigation measures to reduce operational and fuel modification impacts previously identified in the individual topic sections are recommended to reduce these cumulative impacts.

IV Impact Topics

E Impairment

In addition to determining the environmental consequences of the preferred and other alternatives, NPS policy (Management Policies 2001) requires analysis of potential effects to determine whether or not actions would impair park resources. Policies that clarify terms pertaining to "impairment," as well as a prohibition on impairment and what constitutes impairment, are found in Management Policies 2001 (Section 1.4.2 through 1.4.7), which are summarized below.

The fundamental purpose of the National Park System, established by the National Park Service Organic Act (1916) and reaffirmed by the General Authorities Act (1970), as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within the parks, that discretion is limited by the statutory requirement that the NPS must leave park

resources and values unimpaired for future generations, unless a particular law directly and specifically provides otherwise.

Prohibited impairment may include any impact that, in the professional judgement of the responsible NPS manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact more likely would constitute impairment to the extent it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents.

Proposed Actions

Wildfire Suppression

Action will be taken to suppress every fire in the SMMNRA; as a result, most fire starts will be suppressed or limited in scope, but a small percentage will escape initial attack and become major wildland fires. In large wildfire events, suppression operations are not under the control of the NPS, but rest with Los Angeles or Ventura County Fire Departments. The NPS has the ability to provide an engine crew and perform an advisory role to other agencies whose actions will have a direct impact on resources and public safety.

Impacts from wildfire suppression to vegetation, wildlife, habitat connectivity, non-native species, special status animals, soil, water resources/wetlands, and recreation/scenic are mixed: there are adverse operational impacts but the total area burned and the average fire rotation interval are reduced. Impacts to air quality, health and safety, and risk of catastrophic events are all reduced by fire suppression. Cultural resources, special status plants, paleontological resources, and land use have the potential to be adversely impacted by wildfire suppression actions.

The use of MIST (Minimum Impact Suppression Techniques) on NPS parkland will avoid impairment to resources on parkland during suppression activities.

Mechanical Fuel Reduction

Mechanical fuel reduction is performed in a very limited area by the NPS, largely in areas which have been converted to non-native habitat for many years. There is no impairment of park resources from the proposed mechanical fuel modification actions.

Ecological Prescribed Fire

Carried out at the landscape level in shrubland community types, prescribed fire has the potential to adversely impact vegetation, wildlife, habitat connectivity, non-native species, soil, water resources/wetlands, air quality, special status plants and animals, cultural resources, paleontological resources, recreational, and scenic resources. At the same time it provides no predictable benefits to health and safety or to reducing the risk of catastrophic wildfires. When prescribed fire is used for restoration or exotic species control in degraded grassland and oak savanna plant communities the impacts shift from adverse to beneficial. There is no impairment of park resources when prescribed fire is used for the purpose of ecological restoration in annual grasslands.

Strategic Fuel Reduction

The impacts of strategic fuels reduction can not be evaluated without geographically specific project proposals. The analytical procedure required to evaluate the potential risk:benefit ratio has been outlined in the discussion of fire hazard assessment (Figure 3-18). There is no impairment of park resources with strategic fuels modification because projects that impact park resources are not permitted under the decision process for permitting projects.

Education and Community Support

NPS community education and support programs promote fire safety and environmental protection and do not impair park resources.

Summary by Alternatives

Impacts Common to All Alternative

Wildfire suppression impacts are common to all alternatives. Impacts from wildfire suppression are indistinguishable among alternatives.

Fuel modification impacts are common to all alternatives.

Benefits from education and community outreach are identical among all alternatives.

Alternative I – No-Action Alternative

Although never fully implemented, the landscape mosaic prescribed burn program of the 1994 *Fire Management Plan* (existing program) has the potential to impair resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of SMMNRA; (2) key to the natural or cultural integrity of the SMMNRA or to opportunities for enjoyment of the SMMNRA; or (3) identified as a goal in the SMMNRA's general management plan or other relevant NPS planning documents by impacting vegetation, wildlife, habitat connectivity, non-native species, soil, water resources/wetlands, air quality, special status plants and animals, cultural resources, paleontological resources, recreational and scenic resources.

Alternative 2 – Strategic Fuels Reduction, Ecological Prescribed Fire, and Mechanical Fuel Reduction

Because there will be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of SMMNRA; (2) key to the natural or cultural integrity of the SMMNRA or to opportunities for enjoyment of the SMMNRA; or (3) identified as a goal in the SMMNRA's general management plan or other relevant NPS planning documents, Alternative 2 will not result in impairment of resources or values at SMMNRA.

Alternative 3 – Ecological Prescribed Fire and Mechanical Fuel Reduction

Because there will be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of SMMNRA; (2) key to the natural or cultural integrity of the SMMNRA or to opportunities for enjoyment of the SMMNRA; or (3) identified as a goal in the SMMNRA's general management plan or other relevant NPS planning documents, Alternative 3 will not result in impairment of resources or values at SMMNRA.

Alternative 4 – Mechanical Fuel Reduction

Because there will be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of SMMNRA; (2) key to the natural or cultural integrity of the SMMNRA or to opportunities for enjoyment of the SMMNRA; or (3) identified as a goal in the SMMNRA's general management plan or other relevant NPS planning documents, Alternative 4 will not result in impairment of resources or values at SMMNRA.

Conclusions

There is no impairment of park resources under Alternative 2, 3, or 4. Alternative 1, the no action alternative, has the potential to impair park resources.

V Conclusions

Alternative 2 is the environmentally preferred alternative. It provides the maximum potential environmental benefits and minimizes the adverse impacts of fire management actions.

Alternative 2 is the most flexible alternative, utilizing all available fire management strategies identified to be appropriate in the Santa Monica Mountains.

Alternative 1 is inappropriate and the most environmentally damaging alternative in the fire climate of the Santa Monica Mountains. Alternative 4 effectively addresses structure protection at the urban interface, but does not provide any of the ecological benefits from the ecological prescribed burning included in Alternatives 2 and 3. Alternative 2 is considered superior to Alternative 3 because it would not eliminate the potential benefits from strategic fuels reduction.

Although strategic fuels reduction has the potential for both impacts and benefits in most of the impact areas analyzed, individual strategic fuels reduction projects would be evaluated for their potential risk: benefit ratio according to the analytical procedure outlined in the discussion of fire hazard assessment (Figure 3-17).

Chapter Five

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This chapter synthesizes the detailed information provided in Chapter 4 and provides summary information “at-a-glance.” Table 5-1 rates the environmental consequences (or impacts) of each fire and fuels management alternative for each issue.

Table 5-1 Summary of Environmental Consequences of Alternatives For Each Issue Detailed in Chapter 4

Ratings for Alternatives 2, 3 and 4 are relative to Alternative 1 – No Action.

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction/ Ecological Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Vegetation				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	--	--	--	--
• Ecological Prescribed Fire		++	++	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	++	++	++	++
Wildlife				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	-	-	-	-
• Ecological Prescribed Fire		++	++	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/	+/-	+/-
• Education	++	++	++	++
KEY ++ mostly beneficial effects + some beneficial effects 0 no effects - some adverse effects -- mostly adverse effects ? unknown effect +/- both positive and negative effects NEPA/NHPA National Environmental Policy Act/National Historic Preservation Act review				

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction/ Ecological Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Habitat Connectivity				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	-	-	-	-
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	+	+	+	+
Prevent Spread of Non-Native/Invasive Species				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	--	--	--	--
• Ecological Prescribed Fire		++	++	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/- -	+/- -	+/- -	+/- -
• Education	+	+	+	+
Special Status Species – Plants				
• Mosaic Burning	- ? / EA			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	0/-	0/-	0/-	0/-
• Education	0	0	0	0

KEY			
++	mostly beneficial effects	+	some beneficial effects
-	some adverse effects	--	mostly adverse effects
+/-	both positive and negative effects	0	no effects
NEPA/NHPA	National Environmental Policy Act/National Historic Preservation Act review	?	unknown effect

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction/ Ecological Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Special Status Species – Animals				
• Mosaic Burning	+/- ? / NEPA/NHPA			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	0	0	0	0
Soil				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	-	-	-	-
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	+	+	+	+
Water Resources / Wetlands				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	+	+	+	+

KEY			
++	mostly beneficial effects	+	some beneficial effects
-	some adverse effects	--	mostly adverse effects
+/-	both positive and negative effects	0	no effects
NEPA/NHPA	National Environmental Policy Act/National Historic Preservation Act review	?	unknown effect

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction Ecological/ Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Coastal Resources				
• Mosaic Burning	– ?			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+ ?	+ ?	+ ?	+ ?
• Education	0	0	0	0
Paleontological Resources				
• Mosaic Burning	–			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire	0	0	0	0
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	–	–	–	–
• Education	0	0	0	0
Air Quality				
• Mosaic Burning	– –			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		–		
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	++	++	++	++
• Education	+	+	+	+

KEY			
++	mostly beneficial effects	+	some beneficial effects
–	some adverse effects	– –	mostly adverse effects
+/-	both positive and negative effects	0	no effects
NEPA/NHPA	National Environmental Policy Act/National Historic Preservation Act review	?	unknown effect

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction/ Ecological Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Cultural/Historic				
• Mosaic Burning	–			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	--	--	--	--
• Education	0	0	0	0
Land Use				
• Mosaic Burning	0			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		–		
• Suppression	--	--	--	--
• Education	+	+	+	+
Recreation / Scenic Resource				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	–	–	–	–
• Ecological Prescribed Fire		–	–	–
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+/-	+/-	+/-	+/-
• Education	+	+	+	+

KEY			
++	mostly beneficial effects	+	some beneficial effects
–	some adverse effects	--	mostly adverse effects
+/-	both positive and negative effects	0	no effects
NEPA/NHPA	National Environmental Policy Act/National Historic Preservation Act review	?	unknown effect

Issue	Alternative 1 (No Action) Current Program Mosaic Burning Mechanical Fuel Reduction	Alternative 2 Mechanical Fuel Reduction/Ecological Prescribed Fire/ Strategic Fuels Treatment	Alternative 3 Mechanical Fuel Reduction /Ecological Prescribed Fire	Alternative 4 Mechanical Fuel Reduction
Maximize Health/Safety				
• Mosaic Burning	0			
• Mechanical Fuel Reduction	++	++	++	++
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		++ ? / NEPA/NHPA		
• Suppression	++	++	++	++
• Education	++	++	++	++
Reduce Risk Of Catastrophic Events				
• Mosaic Burning	0			
• Mechanical Fuel Reduction	0	0	0	0
• Ecological Prescribed Fire		0	0	
• Strategic Fuels Treatment		++ ? / NEPA/NHPA		
• Suppression	++	++	++	++
• Education	+	+	+	+
Cumulative Impacts				
• Mosaic Burning	--			
• Mechanical Fuel Reduction	-	-	-	-
• Ecological Prescribed Fire		+	+	
• Strategic Fuels Treatment		? / NEPA/NHPA		
• Suppression	+	+	+	+
• Education	++	++	++	++

KEY			
++	mostly beneficial effects	+	some beneficial effects
-	some adverse effects	--	mostly adverse effects
+/-	both positive and negative effects	0	no effects
NEPA/NHPA	National Environmental Policy Act/National Historic Preservation Act review	?	unknown effect

Chapter Six

CONSULTATION AND COORDINATION

I Interagency and Public Scoping

Agencies, cooperators, and other partners had several opportunities to raise issues of concern at the early stages in developing the environmental impact statement. Shortly thereafter, the public was invited to participate with their comments and ideas (attendees are listed in Appendix D).

- A fire management planning workshop was held in June, 2001, for agencies, cooperators, and other partners. Following the workshop, a newsletter describing the planning effort and issues already raised was released to the workshop participants and other interested parties in December, 2001. All newsletter recipients were invited to submit additional written comments for consideration.
- A Notice of Intent was published in the Federal Register in February, 2002 announcing that SMMNRA was updating its *Fire Management Plan*, and encouraging public participation through public meetings and written comment within a six month period.
- Four public meetings were announced and publicized through media announcements and public invitations in late April/early May, 2002. The meetings were held in Beverly Hills, Calabasas, Malibu, and Thousand Oaks, California. Participants were provided with background and information on four alternatives, and asked to submit their comments in writing, if possible, to ensure accuracy.
- Two additional meetings in June, 2002 to gain additional input on these four alternatives from fire agencies, cooperators, and other partners. Their written comments were also solicited.
- Fifteen invitations were sent to citizens with Native American affiliations, requesting their comments and concerns that the four alternatives may have on cultural activities, practices or resources.
- A public comment period was announced on June 16, 2004 through the *Federal Register*. the public was invited to review the *Draft SMMNRA Fire Management Plan/EIS* and submit written comments by September 15, 2004.
- Eighty copies of the *Draft SMMNRA Fire Management Plan/EIS* were sent to libraries in Los Angeles and Ventura counties in July, 2004.
- A press release along with over 300 individual letters was issued in mid-July, 2004, announcing the opportunity for the public to obtain information and ask questions at

four public meetings in August, 2004. This information was posted on the SMMNRA website and was carried by numerous media outlets. The public was invited to call or write the SMMNRA for a copy of the *Draft SMMNRA Fire Management Plan/EIS*.

Some issues raised are of significant and widespread interest, while others were duplicate or peripheral to the formation of this document. Issues raised at the June, 2001 workshop and analyzed within the environmental assessment include:

- 1) Firefighter and public safety including identification of underground power lines, homeowner education about responsibility for fire safety, and identification of high-risk areas using GIS tools and fire models.
- 2) Fuels treatment at the wildland urban interface to optimize effectiveness of property protection and minimize impacts.
- 3) Operational and policy co-ordination among all the agencies within the Santa Monica Mountains National Recreation Area (SMMNRA) including consistent brush clearance policies and uniform emergency plans for all the agencies.
- 4) The impact of fire management activities including suppression actions and promotion of the spread of invasive plants and animals.
- 5) The use of prescribed fire for restoration activities.
- 6) Appropriate land use planning.

II Cultural Resources and Native American Consultation

The National Park Service was invited to present the EIS alternatives and other issues for comment to the Chumash Elders Council in August, 2002. Although they did not respond formally, they expressed concerns with the effects of both natural and prescribed fire on cultural resources. They asked to be kept informed of our fire prescription and management activities. They emphasized that they are not just concerned about what we refer to as cultural resources but are just as concerned with what we refer to as natural resources because they look on all resources as being important to their culture.

Consultations will continue with the Elders Council at Santa Ynez (the only federally recognized entity), as well as with local Chumash and Tongva/Gabrielino groups and individuals. The SMMNRA's cultural anthropologist will coordinate and document these consultations. Other stakeholders, such as homesteaders and pioneers, will also be consulted.

III Interdisciplinary Planning Team Members

Santa Monica Mountains National Recreation Area

David D. Kerr
Fire Management Officer

Raymond Sauvajot, Ph.D.
Chief Planning Science and Resource Management

Corrina Marote
Fire Management Officer

Martin O'Toole
Fire Information and Education Specialist

John Tiszler
Plant Ecologist

Marti Witter, Ph.D.
Fire Ecologist

Robert Taylor, Ph.D.
Fire GIS Specialist

Christy Brigham, Ph.D.
Restoration Ecologist

Kathryn Kirkpatrick
Fire Management Officer

Additional Consultants & Preparers

Alan Schmierer
Environmental Compliance Specialist
NPS Pacific West Regional Office

Nelson Siefkin, Ph.D.
Fire Archaeologist
NPS Pacific West Regional Office

